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ABSTRACT

This publication contains the 37 papers presented at the sixth annual forum of the Association for Institutional Research. Previous forums had reviewed conceptual frameworks and research design and methodology used in institutional research. Subsequent programs, focusing on processes and outputs of academic institutions, will provide companion data to the theme of this symposium -- academic inputs. Papers are organized into sections on financial input, student selection of institution, faculty input, institutional research in facilities planning, institutional selection of students, impact of Federal programs, systems applications, student achievement, and student and institutional characteristics. EA 003 132 is a related document. (RA)

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RESEARCH ON ACADEMIC INPUT

Proceedings of
Sixth Annual Forum of the
Association for Institutional Research
May 2-5, 1966

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Edited by
Clarence H. Bagley

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

1966

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TABLE OF CONTENTS

Preface

The Association for Institutional Research - A History
L. Joseph Lins i

Keynote Address: Imperatives for Institutional Research
Lewis B. Mayhew 1

President's Address: The Birth of a Profession
John E. Stecklein 9

Invited Papers on Financial Input

An Overview
James L. Miller 15
Economics of Graduate Education: An Exploratory Study
Irene Butter 17
Summary of a National Study on Financial Analysis Practices
Homer Still 31

Invited Papers on Student Selection of Institution

Free Choice vs. Planned Accommodation: Contrasting State Approaches to Student Input
Dorothy M. Knoell 39
Some Practical Applications of Research Studies
O. W. Hascall 45
Student Choice as an Instrument of Higher Education Policy
Dan Hobbs 53

Invited Papers on Faculty Input

Data on Faculty in a Small, Independent College
L. Richard Meeth 59
Measurement of Faculty Characteristics in a Large University: Useful Dimensions for the Study of Faculty Mobility
Mary Corcoran 65
Character of Faculty Input in Four-Year Colleges and Universities
Kenneth G. Nelson 71
Dimensions of Professorial Competences and Their Measurement
Gerald H. Whitlock 75

Invited Papers on Institutional Research in Planning of Facilities

Intra-Institutional Planning
William Fuller 77
An Inverse Relationship-The Uses of Facilities Planning for Institutional Research
Tom R. Mason 81
Problems in Planning Higher Education Facilities on an Inter-Institutional Basis
Fred E. Schwehr 87

Invited Papers on Institutional Selection of Students

Assessment of Entering Students Across a Sample of Colleges
Alexander W. Astin 99
Student Selection Research at Antioch College
Ruth Churchill 105
Selection of Students by Colleges Within a State System
John R. Hills 109

Invited Papers on Impact of Federal Programs

An Overview
Leo Redfern 115
Impact of Federal Programs on Institutions and Institutional Planning
Humphrey Doermann 119

Contributed Papers on Systems Applications

A Single Data System for Capital Planning and Operational Analysis
Harry S. Allen 123
Forms and Procedures Used for Implementing Academic Personnel Action: Their Relation to Academic Input
Louis A. D'Amico 135
A Mini-Max Distance Study Incorporating the Use of Linear Programming to Assist in Solving Campus Parking Problems
Keith W. Trowbridge 145
Utilizing Academic Input on a System-Wide Basis
Emerson Tully 151

Contributed Papers on Factors in Student Achievement

The Influence of Geographic Origin and Campus Proximity on Student Academic Quality at State Universities
Ross O. Armstrong 157
Effects on Student Achievement of Residence Hall Groupings Based on Academic Majors
James K. Morishima 163
Methods and Results of Research on Living-Learning Residence Halls
LeRoy A. Olson 171
Estimating Gains in SAT Scores Attributable to Three Sources
Sam C. Webb 175

Contributed Papers on Student and Institutional Characteristics

Changes in Institutional Characteristics as a Function of Selective Admissions
Cameron Fincher 177
Motivation and Performance in a University of Entering Freshmen
Irma T. Halfter 185
Environmental Press Preferences of Students and Faculty
Vernon L. Hendrix 189
Educational Objectives of Liberal Arts Students
John C. Heston 195

Contributed Papers on This, That and Some of the Other

Development of a Set of Guidelines and Information Sources for Use by a Faculty Curriculum Committee
H. R. Kells 205
An Improving High School Record: Good Omen for College
P. Kenneth Morse 215
The Graduate Student at Berkeley: A Profile
Sidney Suslow 221
Faculty Input: A Function of a College's Incentive System
Herman Arnold Wallin 231

Program Committee 241

Program Outline 242

PREFACE

The Sixth Annual Forum of the Association for Institutional Research may have been more appropriately the first conference or forum as a part of a formal organization, of the Association for Institutional Research. A summary of the history of the previous National Institutional Research Forums and subsequent formation of a more formal organization has been included in the Sixth Proceedings in order to add to the reader's understanding of the transition period.

The Sixth Annual Forum retains a traditional structure for providing seminars, contributed papers, discussion periods, and special topics. Thus discussion and participation by each participant remain a vital part of each part of the Forum, retaining the concept of active participation of each member in the Forum.

The theme of the Sixth Annual Forum is the first of three parts relating to the academic institution - input, process, output. The Seventh Annual Forum, to be held May 7-9, 1967 at the University of Georgia will give emphasis to the process. The Eighth Annual Forum, to be held at Berkeley, California in 1968 will conclude the present series.

Clarence H. Bagley
Editor

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH--A HISTORY

L. Joseph Lins
University of Wisconsin

The National Institutional Research Forum, the forerunner of The Association for Institutional Research, was conceived on 14 July 1960 at a luncheon meeting of interested persons held during the "Institute on Institutional Research" sponsored by the Southern Regional Education Board at Tallahassee, Florida, from 11-15 July 1960.

It was agreed that it would be worthwhile to hold an informal national meeting the following spring with the purpose of providing an opportunity for persons responsible for institutional studies to come together to discuss methodological problems of institutional research. It was agreed too that participation would be by invitation only, that the United States would be divided into four areas or regions for the purposes of extending invitations, and that John Folger, the Associate Director for Research of the Southern Regional Education Board, would serve as Chairman of a Planning Committee for the meeting--the National Institutional Research Forum.

Subsequently, a Planning Committee of eight members (two from each region) was appointed. Each region was allowed to invite eight participants, other than the two Planning Committee members, to the first meeting. The regions and the members of the Planning Committee were: an area served by the Southern Regional Education Board: John Folger and John Morris; area served by the Western Interstate Commission on Higher Education: Hall Sprague and James I. Doi; area served by the New England Board of Higher Education: Edwin Hallenbeck and Martin Lichterman; and the Midwest area: L. Joseph Lins and John E. Stecklein. In addition, a limited number of persons from national offices could be invited.

The first National Institutional Research Forum was held just prior to the meeting of the Association for Higher Education at the Morrison Hotel, Chicago, on 4-5 March 1961. The Planning Committee is indebted to Kerry Smith, Executive Secretary of the AHE, and his staff for making many of the physical arrangements for that Forum meeting. In attendance were 16 persons from the Northeast, 10 persons from the South, nine from the West, nine from the Midwest, and two from the U. S. Office of Education--a total of 46.

It was agreed to hold a second informal Forum meeting at the time of the AHE meeting in the spring of 1962. Attendance was again to be limited by region and to no more than 50 persons. The Planning Committee consisted of: Midwest: John E. Stecklein (Chairman) and L. Joseph Lins (Acting Treasurer and Chairman of Local Arrangements); Northeast: J. B. Lon Hefferlin and Edwin Hallenbeck; South: James L. Miller Jr. and John Morris; and West: Kevin P. Bunnell and James I. Doi.

The second annual National Institutional Research Forum was held on 3-4 March 1962 at the Morrison Hotel, Chicago, with a registration fee of $1.00. Honored at the dinner meeting on 3 March for their long service to the principles of and their major contributions to institutional research were A. J. Brumbaugh and John Dale Russell, the "deans" of institutional research.

The group in attendance suggested that the new Planning Committee give serious consideration to expansion of the sessions and to opening up participation to all persons actively engaged and/or vitally interested in institutional research work in colleges or universities or in association with colleges and universities, and that the Planning Committee be selected on the basis of national rather than regional representation with membership increased from eight to 10 members. Five of the members were to be new and five were to be holdovers; the Chairman was to be elected from the five holdover members.

On the basis of recommendations of the group, the Planning Committee voted: (1) that attendance at the 1963 meeting be opened to 200 persons, (2) that the meeting consist of both general and workshop sessions, (3) that there be a nominal registration fee to defray the costs of the meeting, (4) that no formal organization be recommended, (5) that the meeting be held on a university campus, and (6) that the primary purpose of the Forum meeting to be exchange ideas on the need for and methodology of conducting research on institutional problems--research directed to the analyses of data, the results of which contribute to sound administrative judgments and decisions.

The new planning Committee consisted of L. Joseph Lins (Chairman), Robert E. Hubbard (Acting Treasurer and Chairman of Local Arrangements), Samuel Baskin, James I. Doi, John M. Evans, Edwin E. Hallenbeck, James L. Miller Jr., John E. Stecklein, John E. Swanson, and D. Gordon Tyndall.

The Third Annual National Institutional Research Forum was held at the McGregor Conference Center, Wayne State University, Detroit, on 5-7 May 1963. The theme was "The Role of Institutional Research in Planning." The 196 persons in attendance including speakers represented 36 states, Washington, D. C., Hawaii, the Philippines, and Puerto Rico.

It was voted at this meeting that the informal structure be continued for another year, but that the Planning Committee investigate the possibilities and desirability of forming a formal organization of the NIRF with that title or some other appropriate title. The slate of members for the 1963-64 Planning Committee, submitted by the existing Planning Committee, was approved unanimously as follows: John E. Swanson (Chairman), Robert E. Hubbard (Treasurer), Clarence H. Bagley, Samuel Baskin, Stuart Grout, Leroy E. Hull, David B. Martin, James L. Miller Jr., Thomas H. Shea, and D. Gordon Tyndall. It was voted to hold the next meeting at the University of Minnesota, and was announced that John Stecklein would serve as Local Arrangements Chairman and that at the request of the new Planning Committee both he and L. Joseph Lins (Past Chairman) would serve as ex-officio members of the Planning Committee.

Following this meeting, the first proceedings of a meeting were published; this appeared as: L. Joseph Lins, Editor, The Role of Institutional Research in Planning (Madison: Office of Institutional Studies, The University of Wisconsin, 1963), pp. iv + 174, $2.50. This publication now is out-of-print.

The Fourth Annual National Institutional Research Forum was held at the University of Minnesota and the Hotel Leamington, Minneapolis, on 17-20 May 1964 with a theme of "A Conceptual Framework for Institutional Research."

On recommendation of the Planning Committee, it was voted that a formal organization for institutional research be established and that a Constitution Committee be appointed to frame a Constitution to be considered for adoption at the 1965 Forum meeting. It also was voted to approve the Planning Committee recommendation that the Constitution Committee consist of: Robert E. Hubbard (Chairman), James I. Doi, Stuart Grout, L. Joseph Lins, and John E. Stecklein.

The Planning Committee recommendation for members of the 1964-65 Planning Committee was approved as follows: Stuart Grout (Chairman), Stanley O. Ikenberry (Treasurer), John E. Swanson (Past Chairman), Clarence H. Bagley, Arthur J. Hall, Leroy E. Hull, David V. Martin, James R. Montgomery, Leo Redfern, Joe L. Saupe, and Thomas H. Shea (Chairman, Local Arrangements).

The proceedings of the 1964 meeting are published as: Clarence H. Bagley, Editor, A Conceptual Framework for Institutional Research (Pullman, Washington: Office of Institutional Studies, Washington State University, 1964), pp. ii + 106, $2.50. Copies may be ordered from Dr. Bagley, State University of New York at Cortland.

The Fifth Annual Institutional Research Forum was held at the State University of New York at Stony Brook on 3-5 May 1965 with a theme of "Institutional Research: Design and Methodology." During the 1964-65 year, Stuart Grout initiated the distribution of a "Newsletter" to members.

John E. Stecklein, in the absence of Robert E. Hubbard (Chairman of the Constitution Committee), presented the proposed Constitution and moved its adoption formalizing the group as The Association for Institutional Research. The Constitution was adopted and the following slate of officers was voted: President: John E. Stecklein; Vice President: James R. Montgomery; Past President: Stuart Grout; Secretary and Chairman of Membership Committee: L. Joseph Lins; Treasurer: Stanley Ikenberry; and Members-at-Large: Leo Redfern and Joe L. Saupe (one-year term) and James I. Doi and John J. Coffelt (two-year term). Clarence H. Bagley was appointed Editor and an ex-officio member of the Executive Committee by the new Executive Committee.

The proceedings of the 1965 meeting are published as: Clarence H. Bagley, Editor, *Design and Methodology in Institutional Research* (Pullman, Washington: Office of Institutional Studies, Washington State University, 1965), pp. iv + 216, $2.50. Copies can be ordered from Dr. Bagley, State University of New York at Cortland.

The First Annual Meeting of The Association for Institutional Research (the Sixth Annual Forum) was held at the Hotel Somerset, Boston, on 2-5 May 1966--Stuart Grout, Chairman of Local Arrangements. The theme was "Research on Academic Input."

Robert E. Hubbard announced that the Association, as of 7 February 1966, was incorporated in the State of Michigan as a non-profit organization and that all officers were being bonded. The membership at the time of the meeting consisted of 371 paid members (282 Full members and 89 Associate members).

Upon recommendation of the Executive Committee and vote of the membership, the following new members of the Executive Committee were elected: Vice President: Leroy E. Hull; Secretary and Chairman of the Membership Committee: John J. Coffelt; and Members-at-Large for two-year terms: Thomas R. Mason and Dorothy M. Knoell.

Past Chairmen and Presidents with Title at Time of Office

NATIONAL INSTITUTIONAL RESEARCH FORUM

1960-61 -- Chairman: JOHN K. FOLGER, Associate Director for Research, Southern Regional Education Board

1961-62 -- Chairman: JOHN E. STECKLEIN, Director of Bureau of Institutional Research, University of Minnesota

1962-63 -- Chairman: L. JOSEPH LINS, Professor and Coordinator, Office of Institutional Studies, The University of Wisconsin

1963-64 -- Chairman: JOHN E. SWANSON, Director of Universities Study, University of Michigan

1964-65 -- Chairman: STUART GROUT, Director of Academic Services, Boston University

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

1965-66 -- President: JOHN E. STECKLEIN, Director of Bureau of Institutional Research, University of Minnesota

1966-67 -- President: JAMES R. MONTGOMERY, Director of Office of Institutional Research, University of Tennessee

IMPERATIVES FOR INSTITUTIONAL RESEARCH

Lewis B. Mayhew
Stanford University

Institutional research, which just a few years ago was a concept found within only a relatively few institutions, has in a very real sense arrived. Colleges and university administrators have finally discovered the potential values of data for planning and are actively seeking to create special offices charged with planning and institutional research. The evidence for this generalization is of several types.

First, it should be noted that although the concept of institutional research in most institutions is of relatively recent origin, some colleges and universities have been conducting institutional research for a long time. As Yale was being founded its president studied Harvard in an effort to take advantage of the most recent collegiate developments. Presidents of early institutions were from time to time called upon to serve as consultants to developing institutions. The first president of the University of Chicago studied higher education in Europe, kept extensive notebooks regarding educational practices and was one of the first presidents to make extensive use of statistics as he examined the progress of that new institution. It was in the late 1920's that Stevens College created the post of Director of Research and appointed W. W. Charters to serve that role in a part time capacity which he did for twenty-five years. It was in the 1930's that the University of Minnesota and Ohio State University created the basis for the large bureaus which they now maintain.

Secondly, present positions in institutional research appear to be in perhaps larger supply than even vacancies for college presidencies. Salaries being offered people in institutional research range to over $20,000 and a number of positions have remained open for 18 months to two years just because the demand is so much greater than the supply of institutional research workers.

And, of course, the maturity of any effort within the American society is in part determined by the organizations which serve it. The original gatherings of officers involved in institutional research were conducted under the auspices of the Association for Higher Education. Gradually it became evident that institutional research was such a significant movement that a separate and independent organization was in order. This year's conference is one of the efforts of that organization and the topic of this year's conference, dealing with inputs and outputs, suggests a growing preoccupation with theory, another hallmark of a developing profession. The preoccupation with theory is also evidenced in the kinds of reports which currently are emanating from offices of institutional research, reflecting a groping for theory and a desire for hard data respectability.

Over the years, both out of institutional research and out of some related sub-specialties, have come a wide variety of instruments for the collection of data. There are today much more sophisticated tests, inventories, scales, or refined techniques for interviewing and questionnairing and quite sophisticated accounting procedures made possible by the development of high speed computers.

But a paradox begins to emerge. Institutional research although now well regarded, becoming affluent, and well-supplied with technical devices, has yet to make a major impact on the main course of thinking about higher education. Of recent years the works which seems to have had a significant impact on collegiate education have been such things as Clark Kerr's Uses of the University or President Perkins' lectures at Princeton on the Nature of the University. When one thinks of learning theory, even in the collegiate years, one is apt to think of Jerome Bruner and B. F. Skinner and the attendant pedagogical approaches which derive from their work. An understanding of the economic and financial bases of collegiate education has been helped by the work of Harris, Daniere, and Friedman. The college curriculum, perhaps more precisely the undergraduate curriculum, has been influenced by Beardsley Ruml and Donald Morrison with their suggestion that the undergraduate curriculum was hopelessly enlarged. Earl McGrath's monographs on various parts of the college curriculum have elaborated the notions Ruml and Morrison suggested. Paul L. Dressel, drawing in part from his experiences as a director of institutional research, but more largely from his early experiences, has provided a reasonable structure into which he fits the undergraduate curriculum. Philip Phoenix has provided a rationale for the curriculum emphasizing what he calls realms of meaning. Understanding of college faculties, the market place for college teachers, has been furthered by the efforts of several people, one of whom in all candor has derived his insights from studies sponsored by his office of institutional research.

John Stecklein has helped explain what motivates faculties to move or to remain at a major university and in a very real sense corroborated the work of Theodore Caplow and Reese McGee in their The Academic Market Place. John Gustad has suggested what kinds of people faculty members are, and what entices them into their positions. He has demonstrated that faculty members really approach the task of college teaching with little formal training, either before entering the profession or after joining it. David Brown, an economist, has analyzed the market for college teachers in economic terms and has helped considerably to clarify the fact that the practices of the academic marketplace are predicated on a free market when in actual fact the free market does not exist.

Continuing on one finds a number of names associated with growing understanding of college students. George Stern and C. Robert Pace have clearly assisted the profession in analyzing the environmental press and its relationship to student personality. Theodore Newcomb has demonstrated clearly both the impact of the peer culture and its relationship to prevailing socioetilogies. Nevitt Sanford and Joseph Katz have not only indicated approaches to understanding students but deep and penetrating insights as well. The name of Paul Heist is associated with the most sophisticated efforts to understand how it is that students attend different institutions according to their fundamental personalities and interest patterns. Although the flow of students into higher education is still but little understood, something of the physics of this flow has been described by Frank Bowles in his UNESCO sponsored studies of access to higher education. One of the more rapidly growing sectors of American higher education is the junior college movement and no one has assisted more ably in studying, interpreting and understanding that phenomena than Leland Medsker and Dorothy Knoell. Turning to other sorts of institutions, Frederick Rudolph has helped the profession understand the origins of the American college and Oliver Carmichael has sketched in broad strokes the differences and similarities between American and British institutions. Collegiate personnel work has been helped immeasurably by the work of E. G. Williamson and Melvene D. Hardee. Lastly it should be indicated that perhaps the largest amount of data regarding a variety of aspects of collegiate education has been made available to the larger profession not by offices of institutional research, but by such paraeducational structures as the College Entrance Examination Board, the Educational Testing Service, the American College Testing Program, The Regional Complexes, most notably the Southern Region Education Board and the developing data gathering offices in organizations such as The American Council on Education and the Land Grant College Association.

The point is, of course, to suggest that when one thinks of what is really known about the central structures of higher education the names which most quickly come to mind are not, with a few exceptions, those men devoting their full professional talents to institutional research and to the accumulation of information about the enterprise.

This is not to suggest that institutional research has been completely unproductive. Stemming from offices of institutional research have come a number of useful compilations of data. Clearly John Dale Russell and John X. Jamrich have helped in the process of analyzing space utilization and have provided normative data which all colleges can use. A number of offices of institutional research have produced good, if somewhat parochial, descriptive studies of students by classes and have produced some alumni studies which provide the basis for inference as to the effectiveness of college education. Institutional research offices, as well as other agencies, have devoted a good bit of attention to the prediction of academic success and have improved the techniques by which aptitude tests and previous grade point averages are combined to perhaps the level of refinement beyond which it would be fruitless to go. The close connection between institutional research and offices of tests and measurement have also allowed the production of considerable data analyzing test performance, test results, and test refinements.

During the past six or seven years there have been perhaps fifty state surveys of higher education which seem indebted to approaches and personnel actively involved in institutional research. Indeed, looking at a number of state surveys, the reader feels that perhaps they were all based on the same model and quite possibly prepared by the same people. As part of these state surveys and studies within institutions have come some cost studies, a few of which have suggested modes of analysis which other institutions could adopt. And lastly institutional research has provided several important studies of retention and drop-out of students which has forced a reconsideration of older generalizations. The longitudinal studies, developed by Willard Warrington at Michigan State University and the University of Illinois Study of the history of a full freshman class, have shown that while well under half of a normal freshman class graduates in four years, well over half eventually graduate from some collegiate institution.

All of these studies are important and the profession of institutional research is certainly entitled to considerable credit for initiating them and for developing method and technique. But if institutional research is to assume an important creative role in the emergence of American higher education, these sorts of studies are insufficient. There is considerably more for institutional research to do.

As institutional research ponders its future, it must do so in the light of the changing context of higher education and must recognize that higher education is substantially different in 1966 than it was in 1956. Actually American higher education has accomplished much in overcoming what a decade ago were seemingly insuperable obstacles. In 1956 both American secondary education and American higher education were open to criticism on the grounds of lack of rigor and lack of genuine intellectual concern, but in a 10 year period high school curricula in the sciences, mathematics and English have been remolded and higher education has begun to respond with newer formulations in the various disciplines. In the 1950-55 era students were called the silent generation or the apathetic generation. Jacobs' work showed us that they were divinely self-satisfied with little concern for the perplexing problems of society. The present waves of student unrest, the demands on the part of students for fuller participation in educational policy, an interest on the part of students in the fundamental problems of the Civil Rights movement and American foriegn policy, show just how far this generation of students has come from the previous one. Much of the responsibility for this development must rest with the efforts of college professors who did heed the lessons underscored by Jacobs and have taught a generation of students to be responsive to social problems.

Recall also that in 1956-57 the financial plight of college professors was critical. The profession had actually lost ground between 1939 and 55-56-57 with respect to real dollars as compared to other professions and especially as compared to the skilled trades. In 1958 the profession began an effort to double faculty salaries by 1970 and if present rates of increase continue, that goal will have been reached. And it should also be noted that in the period 1954-56 the profession was worried about what Ronald Thompson called the impending tidal wave of students. Suddenly it was pointed out that there had been an enormous increase in the birthrate as well as a shift in college attending patterns and that there simply was not available space for the number of college students who would be seeking admissions within the decade.

The degree of response of higher education is revealed by the fact that in the fall of 1966 something on the order of 5,800,000 students will enter America's colleges and universities and there will be space for them. Although other changes could be mentioned, a last one will serve to round out the parameter of what has actually been accomplished. Even a decade ago college professors were apt to view themselves as somewhat unglamorous, provincial, individuals; concerned with their own affairs and not very highly regarded by the rest of society. This has changed so much that college professors are coming to be viewed as an important element of the power-elite responsible for the leadership of American society. The jet propelled executive is indistinguishable from the jet propelled professor, each on their way to Washington to advise, consult and work with the centers of political power. Thus in a sense a parallel exists between institutional research and all of American higher education. They each have arrived; they each are now faced with the challenge of being successful and they each must face in the immediate future more stringent challenges, more critical problems than they have in the past.

If institutional research is to assume its role in shaping higher education, institutional research workers must turn their attention to the most vexing, unresolved problems and issues which higher education faces. First, higher education in America has prospered by being pluralistic and by maintaining side-by-side a system of privately supported and publicly supported education. Now, however, private education seems to be losing out as larger and larger proportions of students are educated in the less expensive public sector. If present rates continue, by the early 1970's private education will be educating 20% or fewer of all students enrolled in America's colleges and universities. With this situation it is possible to visualize private education as losing its influence on future legislators, donors, opinion-makers, and the like. This tendency is especially likely for the private liberal arts college which in the past has left its mark on so many of the nation's leaders. Somehow new economic formulations must be evolved if private higher education and especially the private liberal arts colleges are to remain viable.

A second problem involves the need for new ways of teaching those elements of the population which previously remained untouched by higher education. The enterprise has been rather successful in developing ways of teaching children who came from culturally advantaged homes but it is now faced with the likelihood that by 1980 some 80% of the entire college age group will be enrolled in some form of collegiate education. Much of this increase will come from such elements of the population as the American Negro, the Puerto Rican, the poor white from Appalachia and even the American Indian for whom existing modes of instruction are likely to prove ineffective. It will be up to educational research and, within the college setting, to institutional research to experiment with, to put into operation new and at this point completely unknown approaches to instruction.

A third problem area is finding ways to accommodate the three major functions of a collegiate institution or finding new institutional forms to meet these needs. Traditionally, American colleges and universities have assumed responsibility for teaching, for research, and for service. The fact that this combination is a historical accident is irrelevant but since these functions have found their way into the structure of higher education, and since the demand for all three is enormously on the increase, some modes of balance are necessary. One possibility which even now seems reasonably well advanced is to create new institutions which handle the research function, leaving the collegiate effort concerned with teaching and with service. Just as an example Paul Lazarsfeld generalizes that typically little educational research is done by professors of education. The bulk seems to be done outside of the university in the so-called para-educational agencies. It is possible, and again this development is under way, that the colleges and universities might surrender major components of their teaching function. It is significant in this regard to note that in 1965-66 some 25 million adult Americans were involved in some kind of formal educational program, two-thirds of which were located in non-educational institutions. Whichever new formulation comes about it should be based on the sort of knowledge and insight which institutional research can provide.

Possibly a related problem is that of finding ways to approximate the presumed values of smallness with the inevitable growth of bigness and the power and richness which large size allows. A corollary, of course, is to approximate the presumed values of students going away to college with the realities of a commuting college population. The facts of what is happening are clear. Well over half of America's college students attend college in urban centers of 100,000 population or more and 25 per cent of the nation's colleges educate approximately 75 per cent of the nation's students. The problem is, within this context of urban bigness, how can presumably essential primary group relationships be fostered and maintained? Particularly, do offices of institutional research on large campuses have a significant challenge to sponsor experimentation and to provide data on the basis of which their own and other institutions may plan.

It has always been an enigma why some institutions suddenly begin to grow, develop and become strong while other similar institutions remain static. During the next several decades there is no question but that there will be enormous resources to assist some institutions to develop. However, donors, philanthropic foundations, and the Federal government all want to place their resources at the disposal of those institutions which have the potentiality for growth. It is possible to hypothesize that the factors making for growth or for retardation can be established through the techniques and approaches of research. One might hope in this regard that some kind of a cooperative research effort of many different offices of institutional research might assist in discovering the constituency of institutional dynamism.

Of a somewhat different order is the need to reconcile the claims of specialized institutions with actualities and potentialities. A case in point is the junior college which claims to offer transfer work, general education, technical vocational education, adult education, and community services. Its claims are many and its achievement in one sense has been significant. However, greater understanding is necessary to study the phenomena that 60% to 75% of students who enter a junior college as matriculated students enter a transfer program, whereas only 12% to 15% of the entering freshman class actually proceed to graduation.

Then, too, higher education is charged with the responsibility of helping students and faculty create and inculcate systems of values which are relevant in a secular and pluralistic society. At present the plight of students is well documented. Institutional research can assist in cataloging student values, can catalog emergent trends in college education and through these devices can facilitate dialogue out of which should come new value systems.

The differential between employer expectations and what the colleges can actually produce needs to be studied also. People in a number of corporations are beginning to feel that perhaps colleges cannot really develop vocational skills in students since the form and operation of vocations are changing so rapidly. College faculties seem to be preoccupied with one approach to education which is at variance with the needs of the consumer of education, that is, the larger society.

During the 1940's and 1950's American secondary education came under sharp attack by the supporting public. Secondary and elementary education were caught in the unenviable position of not being able to interpret themselves to the public in acceptably empirical ways. One can predict that the decade of 60's and 70's will see collegiate education come under similar fire particularly as its costs increase so much more than do other materials and services within the culture. Colleges and universities will be called upon more and more to interpret what they actually do and to justify their requests for increased support. It is here that institutional research can make a major contribution by providing the data for which reasonable evaluations can be made.

A common phenomenon seen in colleges and universities all over the country is that the student population has doubled or tripled in a decade, that operating budgets have tripled or more, and that physical plants have been enormously expanded. Yet many of these institutions are using administrative structures which were much more appropriate when the institutions were smaller and less complex. A recent group of college and university presidents pointed out that the most serious internal problem facing colleges and universities was in speeding up the decision making process to bring the collegiate enterprise in line with the rapidly evolving conditions of the rest of society. Once again institutional research has the potentiality of studying this matter of size and administrative structure and of providing sounder basis for administrative decisions.

Two other problems must be mentioned. The first is to define new roles for students, faculty and administrators in a changed concept of higher education. The recently expanding interest of faculty members in the possibilities of trade unionism and an adversary sort of relationship with administration, suggest that faculties are no longer satisfied with older roles. The recent demands for students to be involved in educational policy making suggests that students are currently seeing themselves in a different light than they did previously. The advent of technology, developed to meet educational needs, suggests the possibility of roles for college professors different from the stereo-typic one of a lecturer to large groups of students. It is possible to imagine a time in the not too distant future when most formal classwork will have been dispensed with. Here institutional research can examine the imperatives making for changed role relationships and can perhaps provide the data, out of which faculty, students and administration can accept themselves under new conditions.

Lastly, in one way perhaps the most perplexing problem of all, is for higher education to meet the twin and perhaps seemingly incompatible demands of education for an elite and education for all. The full significance of this problem is well portrayed in the remark by Allen Cartter that the region of the old confederacy is faced with an irreconcilable dilemma. It can only afford to develop a few centers of excellence or no centers of excellence, placing its efforts on upgrading the broad base of the population. It is also revealed in the suggestion by James B. Conant that perhaps 40 or 50 universities and 40 or 50 elite colleges should be viewed as the principal producers of the technical, professional, scientific, leaders which the nation will need. Students accepted into any of these would be acceptable to all. As for the rest of the population, it would receive its education in lesser sorts of institutions. President Perkins in his Princeton lectures again made the same point, suggesting that those students who were going to attend the university would have an undergraduate-graduate sequence arranged according to their needs which would be different from the large mass of population. President Perkins visualized even a reduction in the number of people attending a university, for the university would cater to the elite. This, of course, runs counter to the historic tendency in higher education which has from earliest times been increasingly democratic with each generation. Whether or not these conflicting roles can be reconciled is unknown. What is known is that the problem is worthy of inquiry and hopefully offices of institutional research would be concerned.

These are the problem areas within the context of which institutional research might find its opportunity. Obviously no grand design for such comprehensive efforts can be prepared but some guidelines can be suggested.

First, institutional research workers should appreciate and accept the fact that the field is still a new one, not unlike the natural science field a century ago. The imperative is to concentrate descriptive studies so that within a few years there will be available a sufficient quantity of data which can provide the basis for more theoretical subsequent efforts. Secondly, much of the research work of institutional research has been reported in a fugitive form. Hence it has not really had the impact which the worth of the studies would want. An example comes to mind in the form of Philip Jacob's Changing Values in College. Jacob gathered together a number of fugitive studies but by putting them in a book form and drawing generalizations from them, his book has significant impact on higher education. What is being suggested here is that more monographic publications should come from the institutional research sector of the profession than has been true in the past.

Third, unless institutional research is able to rectify its personnel situation it is likely to be somewhat impudent. There are more positions open than there are qualified people to fill them. Institutions and organizations have been tempted to place inappropriately trained or inexperienced people into institutional research roles just in order to claim that institutional research is part of the organizational fabric. One college appoints an assistant admissions officer as director of research, another para-educational organization appoints a person without any research training or experience as a director of research and aids him in asking that a multi-million dollar research and development center be established with him as its director. The federally supported research and development centers have been well funded but seem to be running into serious difficulties simply because of the lack of availability of qualified people to do the research. Very likely offices of institutional research could well serve themselves if they would effect some relationship with the training function of their institutions and actually develop programs which could produce qualified workers for the future.

A fourth suggestion is that institutional research workers should be more willing to extrapolate and suggest the administrative and practical implications of their research rather than allowing others to draw these inferences for them. Institutional research is applied research and in a very real sense should be one form of political behavior. Although one would not want institutional research workers to become overly involved, still some involvement is necessary and good institutional research must find its way into the decision making processes which are fundamentally political.

The problems which have been underscored are large problems, many of which are not susceptible at this moment to solution through hard data alone. Institutional research workers seem to have been a little pre-occupied with hard data, overlooking the values of soft data. In addition to overly refined studies one could hope that institutional research would attempt to grapple with the largest most perplexing questions of higher education and present some evidence even though the design is not as rigorous as might be desired. Here it might be kept in mind that statistics is really a conservative science which finds its best use in validating the clinically arrived at hunches of a research worker.

Relatedly, institutional research needs constantly to keep in mind the need for mediating between research evidence and administrative realities. Workers need to value the artistic leap to insight which frequently leaves a gap between a decision and absolute evidence.

Lastly, workers in institutional research are urged to try to understand educational policy in the broad sense and to seek ways of injecting research and research evidence into it. The greatest contribution of institutional research would be to provide a factual, empirical base upon which national, regional, state, and local policy can be based. But to do this requires workers who understand policy demand.

President's Address

John E. Stecklein, President
The Association for
Institutional Research

THE BIRTH OF A PROFESSION

"Hitch your wagon to a star," Emerson has said. This is the kind of advice I feel I am giving a young career-hunting man or woman today when I recommend that he or she look into institutional research. Far from being a fad--as some people have implied--institutional research has a flourishing future. Interest and demand are at a peak: whereas there were perhaps only a dozen established institutional research offices a decade ago, our analysis of AIR members easily suggests over 100 such offices today and nearly 250 persons who spend more than half of their time on institutional research. We are witnessing the birth of a profession, a profession that can become an important force in higher education throughout the world.

The extent to which such growth continues and the profession achieves stability and status depends, however, on how well each of us transmits an image of solidity and value through our research efforts. The first step in this process is to clarify what institutional research is--its purposes as well as its techniques and substances--and how each of our individual roles and institutional identities (or expectations) corresponds to this general concept.

A few days ago I received a copy of a very thoughtful address on institutional research made by Henry S. Dyer, Vice-President of the Educational Testing Service.[1] I was interested to find that he had expressed some of the thoughts that I had built into the rough draft of this paper. Mr. Dyer contrasted the positions taken by Nevitt Sanford and John Dale Russell on institutional research: Sanford had stressed the need for intensive, theoretically-oriented, long-term research by a research unit free from demands by the administration (or faculty) for information needed for immediate problems of the institution; Russell, on the other hand, saw institutional research as an arm of the president's or executive vice-president's office, with the primary goal of finding how to use financial resources to better advantage. Dyer says, "It is hard to imagine two conceptions of institutional research that could be farther apart than these two." In the first, "...the institutional researcher is given carte blanche to poke his nose into any institutional problems he thinks will provide an opportunity for formulating and testing theories about student development and institutional behavior." In the second, "...he works on the operational nuts and bolts problems assigned by his boss for the purpose of finding ways to stretch the institutional dollar as far as it can be stretched."

Where do you stand in relation to these two poles of thought?

The various guises of institutional research as currently practiced may be inferred from some of the preliminary analyses of the AIR membership. About two out of five of us hold the title of director, assistant director, or associate director of institutional research. Other titles include university statistician, director of computing center, coordinator of evaluation, coordinator of research, registrar, director or vice-president of planning, budget analyst, dean of administration, assistant to president, dean, and project supervisor. These titles may or may not reflect the degree of priority given to institutional research by these people or the scope of their responsibility. However, nearly a third spend less than half of their time on institutional research, according to their own estimates. In one sense, this mixture of titles is good for the organization and good for institutional research, because it probably reflects the different perspectives that are brought to the field in the different institutions. In another sense, it is bad, because it suggests that institutional research is a peripheral or extra activity, a point of view that may be necessary in a very small college, but which, if widely held, would be a distinct handicap to the growth of institutional research as a profession.

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[1] Henry S. Dyer, Institutional Research and Measurement in Higher Education, mimeographed revised form of three lectures given in February and March, 1966.

A second factor that will probably determine the future growth of institutional research is the subject matter backgrounds of those in the field. Eighteen per cent of the AIR members majored in business or statistics, 15 per cent in psychology or educational physchology, 11 per cent in educational administration, and 8 per cent in the sciences. Forty-six per cent majored in some area of education, if all areas are combined, to give that subject field a large margin over the next most frequent major field (business or statistics). It will be interesting to see whether the major-field-by-age analysis shows us a continuation of this picture at all ages or a trend to more majors in the social sciences in the younger age brackets, a trend which some have deemed essential if institutional research is to broaden in concept.

If we provide the kind of useful assistance of which we are capable, I do not think there is any doubt that institutional research will become an increasingly important force in the better understanding and operation of our colleges and universities. A number of new problems face our colleges, and especially our universities, that will require massive data and information gathering and analysis which will make what we have been doing in the past look miniscule in comparison. In fact, as I envision the scope of responsibility that institutional research offices might assume in the next decade, the prospect is awesomely challenging. I am thinking, of course, of the trend toward the so-called multi-versity--a complex of instructional units, research institutes, governmental service units (both national and international), and agencies for special studies of numerous problems of humanity--statewide, regional, and national--as well as self-contained elementary and secondary schools. I might add that I think I detect a similar, but somewhat attenuated, trend among even the smaller universities and liberal arts colleges. Systematic and continuous institutional study is imperative if an institution is to attain and/or hold some sense of identity, some clear-cut image of what it is, and what it thinks it should be doing, in the midst of the explosion of research, service, and educational demands and opportunities that now confront our colleges and universities.

What is the role of an institutional research office in this self-study?

First of all, it provides the continuity of self-examination. Secondly, it must collect, collate, and synthesize facts, information, and attitudes that will include both faculty and administrative ideas and points of view. It must increasingly serve as a major point of intersection of faculty concerns and administrative concerns. It will be called upon increasingly to provide basic data and information to be used as a basis for judgment by administrators; it should also be doing this for faculty committees who are assigned the responsibility of looking at the institution as a whole, as well as for faculty groups concerned about sub-units of the institution. It should work with faculty in helping to evaluate existing functions and programs and in experimenting with new techniques that might be used to improve the educational program, in terms of either quality or efficiency, but preferably in terms of both. It can be helpful in setting up guide lines that might be used to assess the impact upon the institution as a whole or upon any unit within the institution of an extension of functions, e.g., a poverty corps program, a research institute, or special overseas programs.

I believe one of our biggest problems is that for so many years our colleges and universities have been operated on a seat-of-the-pants basis--by both administrators and faculty members--without any careful studies to show how well they were doing. Not only are there few studies to show that a particular type of program or a traditional method of instruction in colleges and universities is an effective way of educating our youth, but equally non-existent are studies to show that it is the most effective way of educating our youth. Similarly we have almost no studies that deal in depth with the long-range effect of basic policy decisions by central administration or by boards of control.

An educational program is changed quite radically. Why? Because a number of faculty members believe that these kinds of changes will produce a more effective student or that the proposed change will make the program more related to what is currently going on in the field. Several faculty members are very persuasive and are able to convince the majority of the group that the program should be changed in the manner proposed and the program is changed. Nine times out of ten no kind of evaluation is planned, no controlled situation is set up where the educational outcomes of the modified program can be compared with the educational outcomes of the old program. In the majority of cases the modified program means an increase in staff and an increase in the number of courses offered. Very seldom are studies made of the individuals after they have gone into the field to see what the employers' reactions are to the products of the modified program.

Another faculty member goes to his administrative superior (or vice versa) and indicates that he will be able to get a large sum of money from a national agency if the university will establish a research institute. This federal money may be available both for capital construction and for equipment and staff. Consultation with faculty groups about the proposed institute usually will bring out any strongly documented objections because there is little basic factual information about the effect of the establishment of such units. Objections usually will be based on subjective bases such as, that it will cause an imbalance in the institution, that it will create a favored faculty segment, or that emphasis on institutional functions will change. Few studies are made after such a unit is established to determine to what extent it is in fact modifying the stated goals of the institution, the impact of the institute on the time and activities of faculty members involved, the impact of the institute on faculty attitudes toward the students, and whether or not the establishment of such an institute has a strengthening or a weakening effect upon institutional identification and loyalty. Probably the most readily available studies are those that show disparate salary schedules for individuals within and without the institute.

One area that particularly needs study, in my estimation, is the curriculum. Several years ago Ralph W. Tyler listed these criticisms of present day curriculum in higher education, among others:[2] (1) The curriculum covers too much. It has become so broadly oriented, and includes such diversity of subject matter, that it is not possible to do a good job with any of it; (2) The curriculum is in a continuous process of proliferation. Tyler estimates that the number of courses offered will double or more than double in ten years; (3) There seem to be no clearcut educational purposes in the minds of teachers or students which guide their efforts; (4) The curriculum does not provide adequate sequential development of student learning. Tyler excepts some courses, such as those in foreign languages from this criticism; (5) There is little interrelation among the areas of instruction. Even within the same general field students often do not understand the relations among its various sub-fields; (6) The curriculum of the colleges and universities generally lacks effectiveness partly for the reasons commonly given--the explosion of knowledge, the large numbers of students, the scarcity of qualified teachers--but more often because it is not being built on the basis of a careful and thoughtful examination of the tasks involved in curriculum development.

While these criticisms are not true of all curriculums, or even of all courses offered within a given curriculum, they are true of far too many. The point remains, nevertheless, that far too little institutional research has focused on curriculum development, structure, or goals. To be sure, this is probably one of the most difficult areas of study. It is also one of the areas that in the eyes of many faculty is most sacrosanct, and that will require the greatest amount of rapport between the institutional research office and faculty members, in conducting studies. Nevertheless, until some unit like the institutional research office can arouse in the faculty enough concern for balancing the educational program with the most efficient use of available resources, many of the criticisms that Dr. Tyler lists will be perpetuated and will result in increasing problems for our colleges and universities.

Beardsley Ruml pointed out the dollar savings that could be made by drastic curtailment in the number of courses offered, and the ways in which the money saved could be utilized to increase faculty salaries. At least one institution has carried out this suggestion and has been able to offer fantastic salaries. It has not met with wide-spread acceptance, however, and there has been little exploration to determine what the balance point is between course curtailment and a minimal curriculum of quality.

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[2] Ralph W. Tyler, "The Curriculum in Higher Education," Higher Education Tomorrow, Proceedings of a Faculty Conference at the University of Minnesota, 1962.

A newspaper article that some of you may have seen several months ago illustrates very well, I believe, that efficiency and maximum utilization of resources can be overdone:

The story said that a young mother of three children was in her basement one day, washing clothes. She was just about to put in the last of her five loads when it occurred to her that she should make the job complete and wash the clothes she was wearing. She thereupon completely disrobed, put the clothes in the washer and sat down to wait. As she sat, she noticed that water was dripping on her head from condensation on the pipes overhead. Since she had just put up her hair and didn't want it ruined, she quickly grabbed her son's football helmet and put it on and sat down. A few minutes later she heard a noise and looked up to see the meter reader from the gas company standing there. After a second of shocked silence, the meter reader regained his senses first and calmly commented, "Well lady, I sure hope your team wins!"

A second moral of this story is that one can never know what reaction to expect when efficiency is inappropriately realized.

I believe that for a college or university institutional research office to survive and thrive, it must have a broad concept of its role in the institution. It should not be identified or think of itself simply as an operations research unit for the administration. Conversely, it should not be solely concerned with studying the educational process or curriculum development in a theoretical context. It should be identified as a place where concerns for the effectiveness of the institution are merged with concerns for institutional efficiency in the studies conducted. Again, to quote Henry Dyer, "If institutional research requires involvement in the institution, then it had better be done by all the people who are or ought to be most deeply involved in the institution --those who are responsible for its teaching and research, as well as those responsible for its governance."

What I am saying, in substance, is that principles of management science can be applied effectively to institutions of higher education, but they cannot be applied in a vacuum that excludes faculty concerns about institutional goals and educational values. We must remember that, to be really effective, our research and its findings must be accepted by the faculty--a group composed of individuals who cherish their professional identities and who will resist to the utmost being treated as simple pieces of massive educational machinery that must be trimmed or shimmed to produce the maximum number of units of output for minimum cost.

Now, what are the implications of these comments for the future role of The Association for Institutional Research? If institutional research is to achieve a high professional status, it must not be identified solely with the mundane, routine data collection and tabulation procedures that are commonly associated with cost studies, space utilization, course counts, enrollment projections, and budget analysis. It must continue to serve these increasingly important functions, to be sure, but it must also develop as part of the professional perspective a concern for more basic research devoted to a better understanding and critical evaluation of fundamental educational policies and practices monotonously replicated on the current higher education scene. The institutional research office will provide an opportunity for such studies within a particular institutional setting, and a multitude of such studies will provide information about fundamental issues in a variety of settings.

The Association will be most successful if it can bring into existence a concept of institutional research that will combine questions of quality and quantity, and bring the temper of educational values into the forging of economy and efficiency tools. It will be successful if it can, through its membership, stimulate college and university faculties and administrators to examine basic precepts involved in changing institutional goals or functions. It can be effective if it can inculcate in its members the idea that while the institutional research office may be primarily a service agency, this service can be active as well as passive. By passive service I mean doing simply what someone asks you or tells you to do. By active service I mean asking sometimes embarrassing or even impertinent questions, making discreet inquiries or special analyses on your own initiative, continually looking at the institution as a whole, and studying the effects of actions taken in one part of the institution upon the total institution or upon other parts of the institution.

The Association can assist in the development of individuals with broad-gauged educational insights by sponsoring or otherwise supporting educational services like the summer institutes that the Executive Committee proposed for support today, and perhaps others, by a carefully thought-out publications policy, and by providing the opportunity for exchange of ideas, formal and informal, that these annual forums present. The tone and type of journal articles and monographs, yes, and even newsletters, published by the Association will all contribute positively or negatively to the strength of institutional research as a profession. One thing we desperately need is better dissemination of our research--its design, methods, and findings-- among ourselves. In his speech, Dr. Mayhew indicated how little evidence there is in literature citations to show that institutional research people are having any effect. One reason is that many of our efforts are inner-focused--for internal use only--and no one else ever sees their results. Certainly much information is highly confidential and too hot to let out, but I am convinced that we can do a lot more than we are now doing to share our studies with others in the profession, both with and without accompanying requests for confidential handling.

Individually, members can promote the idea that the institutional research officer is a generalist, not just a nuts and bolts specialist, capable of dealing with and understanding the viewpoints of personnel in all parts of the institution, capable of bringing to bear on problems different viewpoints that he has picked up in these dealings, and capable of maintaining a neutrality and research objectivity that is essential to the acceptance of his work.

It has been a great pleasure and honor serving as your president this year. I am sure that the Association will continue to develop into a virile and vital organization under the guidance of the executive committee members you have selected for next year. I want to thank again the hard-working members of my executive committee, and of the membership and planning committees for making this the successful year that it has been. I know that each of you will have opportunities to contribute to the Association's growth, informally or formally, and I recommend that you take advantage of each opportunity, for it will be truly worthwhile.

FINANCIAL INPUT: AN OVER-VIEW

James L. Miller, Jr.
Southern Regional Education Board

My function during this session is to serve as chairman and to make some introductory comments concerning the general topic of financial input that will provide some perspective for the two major presentations which will follow. There are two topics which I would like to discuss briefly: first, a few of the premises which underlie a consideration of any system for the analysis of financial input in higher education; and second, the historical background of higher education financial analysis, which I believe will put the two major presentations into historical perspective.

The first premise upon which any attempt at financial analysis in higher education is predicated is optimism. Obviously, underlying such an effort is the belief that higher education can be supported in American society. If this belief were not held, no purpose would be served in attempting to study the financial situation. Stated another way, this optimism is a basic faith that the resources are available to support higher education and that one way of helping to insure that they actually are devoted to higher education is to analyze the financial position of higher education, including its needs.

A second premise which underlies higher education financial analysis is a certain Puritanism which is characteristic of many facets of American life. In higher education, this expresses itself as a belief that colleges and universities ought to be run efficiently. It is an interesting paradox in American culture that some things such as cigarettes, liquor, and cosmetics are not expected to pass the test of efficiency, but we do expect that most of our organizational institutions such as businesses, industries, government, and higher education will meet some test of efficiency and not be guilty of "waste."

Another underlying premise is a belief in rationality and systematization. This expresses itself as a basic confidence that there is a rational pattern to higher educational cost and our only problem is to discover it.

Still another underlying premise which is specifically applicable to higher education is a belief in the primacy of function over system, that is, a belief that the analytical procedures must describe and follow the functions of instruction, research, and public service rather than control them. This emphasis upon purpose rather than procedure is a completely appropriate one; nonetheless it also is the cause of certain difficulties. For example, it is the reason that some accounting procedures from business and industry cannot be directly applied to colleges and universities; and it also is the reason underlying the often expressed skepticism of faculty and administrators concerning financial analysis.

These then are a few of the usually unspoken premises which underlie our efforts to analyze the financial input into higher education. I now would like to turn to a brief historical statement concerning the development of financial analysis.

The increasing standardization of higher education accounting systems is a sine qua non of any such analysis. Although the history could be traced back to a still earlier period, it is sufficient in a summary such as this to assert that the development of generally accepted standardized accounting for higher education began in the late 1920's and early 1930's with the work done by the National Committee on Standard Reports for Institutions of Higher Education, which issued its report in 1935. The work of that committee was updated in the early 1950's and still is the standard reference in its published form as Volume I of College and University Business Administration, which appeared in 1952. That volume currently is in the process of revision once again.

Another important element in the historical background of college and university financial analysis is the work done by a group of men based at the University of Chicago in the late 1920's and the early part of the 1930's. This group included John Dale Russell, A. J. Brumbaugh, Floyd W. Reeves, Lloyd Blauch, and others. They published several volumes based upon their studies of groups of institutions. In these volumes, they enunciated a number of basic principles which in modified form are still followed today. (Among these volumes are College Organization and Administration: A Report Based Upon a Series of Surveys of Church Colleges, 1929, and The Liberal Arts College: Based Upon Surveys of Thirty-Five Colleges Related to the Methodist Episcopal Church, 1932.)

Another landmark in the development of college and university cost analysis was the work done in New Mexico in the mid-1950's by John Dale Russell and James I. Doi. Russell and Doi developed a system of financial analysis which was written up in a series of articles in College and University Business magazine during 1955-56 and which also appeared in revised form in the proceedings of the first Institute on Institutional Research sponsored by the Western Interstate Commission for Higher Education, College Self-Study Lectures on Institutional Research (1960). Russell and Doi developed a cost analysis system which subsequently was utilized in several other states including Colorado and Utah.

A cost analysis system of a different type was developed and used by the public institutions in the State of Indiana. In addition, during the 1950's and early 1960's, a number of states developed budget formulas, which in one fashion or another attempted to estimate roughly the costs of institutional operation. Among these states were California, Texas, Oklahoma, Florida, Kentucky, and Tennessee.

A study of major significance was the "Sixty-College Study" and the "Sixty-College Re-Study" (A Study of Income and Expenditures in Sixty Colleges--1953-54 and The Sixty-College Study: A Second Look, 1960.) The sixty-college studies dealt with small institutions. Equally significant was the California-Big Ten study, which attempted to assess cost patterns in large complex universities (California and Western Conference Cost and Statistical Study).

These are some of the major landmarks in the history of our attempts to develop and refine cost analysis techniques. Today we will hear summary descriptions of two additional studies which form new landmarks in this progression. The first is a three-year study, just published by the University of Michigan, which reviewed the procedures used by a large number of institutions for analyzing current operating costs and then made recommendations for the development of a new system which, if generally adopted, might meet the need for comparable financial information from a variety of institutions. The second is a study of these economics of higher education which was designed to assess both the economic input and the economic return of graduate education and derive from this analysis some measure of the economic return of an investment in various disciplinary fields. As one aspect of this economic study it was necessary to obtain financial input information from the participating universities. When it was discovered that comparable information was not available from these universities, the overall study had to be modified so as to give attention to developing such information. Our presentation today will deal with only that aspect of the study which attempted to develop a system for measuring the cost of graduate education. The full report will be available in its final form sometime during the summer of 1966.

In view of the reasonably extended history of attempts to develop adequate cost analysis techniques, I think it unlikely that either of the studies which will be reported upon this morning will provide the final solution to the question at hand. I do believe, however, that each of them has made and will make an important additional contribution to our progress toward an ultimate, satisfactory answer.

FINANCIAL INPUT OF GRADUATE EDUCATION

Irene Butter
University of Michigan
Flint College

This paper reports some results of a study on investment in graduate education. One purpose of this study was to determine the feasibility of identifying and measuring costs of training Ph.D.'s in four disciplines. Further objectives included calculation of total social costs per Ph.D. and the social rate of return, or pay-off, on the investment in a Ph.D. First, methods, procedures, and sources of the data will be discussed. Next, some conceptual problems inherent in the study will be presented. The last part of the paper will be devoted to selected results and interpretation.

For purposes of this study, university departments are viewed as enterprises analogous to business firms, engaged in combining various inputs to produce multiple products. The real inputs to be considered consist of goods, such as: buildings, supplies, equipment, and library materials; as well as of services such as those supplied by students, teachers, and administrative and clerical personnel. Inasmuch as interest is focused on the total social cost of Ph.D.'s, rather than on the consumers' cost or the suppliers' cost, the relevant financial inputs include expenditures financed by the institution, as well as those financed through subsidies from outside sources.

Identical inputs are employed by a university department to produce a multiplicity of services including: undergraduate training, graduate training, production of new knowledge, selection and encouragement of potential talent, recruitment and instruction of potential teachers. Inasmuch as joint production is basic to the productive processes carried out by university departments, one of the major tasks of this study is the identification, allocation, and measurement of all costs that enter into graduate training per se. In the analysis of the graduate training function of a department, annual output will be measured in units of graduate student credit hours produced.

All inputs which contribute to the production of graduate student credit hours during a year must be identified and measured in terms of their dollar value. Whenever inputs are used jointly for the production of graduate student credit hours and other departmental outputs, their costs must be distributed accordingly.

It should be noted that the analysis of the production function of a university department is complicated not only by the existence of joint production but also by a high degree of product heterogeneity. Significant quantitative and qualitative differences in the requirements demanded of students by different departments underlie the more or less undifferentiated title of Ph.D. degree. While the quantitative differences will be presented and analyzed in this paper, the qualitative differences in requirements are not made explicit by departments and therefore do not readily lend themselves to measurement. Moreover, the qualitative differences between groups of students entering the different departments also contribute to output differences among graduate departments in the same discipline.

The following point is related to the heterogeneity of output of graduate departments in the same field. An important aspect of any graduate department, relative to others within the same discipline, is the extent to which it engages in the production of new knowledge. In this analysis the research process is explicitly considered an essential element of a graduate training program, and a part of the cost of research inputs is calculated as part of the cost of training Ph.D.'s. The exact treatment of research costs will be described subsequently.

This study was conducted under financial support from the Cooperative Research Branch of the Office of Education, U. S. Department of Health, Education, and Welfare.

Design and Procedure of the Study

This study presents estimates of the social cost of training Ph.D.'s in four disciplines: a physical science - Physics; a biological science - Zoology; a social science - Sociology; and one field in the arts - English. Data were collected at a sample of eleven universities, and the following are the major factors which entered into the selection of the sample:

1. geographical distribution
2. variation in size
3. inclusion of public and private universities
4. inclusion of institutions with a reputation for good, mediocre, as well as poor record-keeping.

For two reasons it was desirable to gather data from a heterogeneous sample of universities. Since the study is in part a feasibility study it was necessary to consider whether the required information was always retrievable despite the wide variation in existing record-keeping practices of universities. One objective of the study was to ascertain whether the costs that enter into the training of Ph.D.'s can be identified and measured, even at institutions which presumably have a reputation for poor record-keeping. This objective necessitated the inclusion of institutions with diverse accounting systems. Furthermore, it was felt that in order to make the estimates of average total costs of training Ph.D.'s as representative as possible for the graduate training programs of a given discipline, the data on which the estimates are based should be gathered from a group of departments of considerable heterogeneity. Along with variation in the four above criteria which governed selection of the sample, participating institutions and departments are also diverse with respect to indices of quality.

In this study the following were considered to be basic in determining the costs of graduate training:

1. Instructional costs consisting of:
    (a) graduate faculty salaries
    (b) staff benefits
    (c) departmental supplies, equipment, and clerical costs

2. Research costs, derived partially from expenditures for sponsored research projects conducted by graduate faculty.

3. Costs of physical facilities.

4. Administrative costs, including both general university and departmental administration.

5. Library costs.

6. Opportunity costs.

These six items constitute the major components of the cost of graduate education. Additional costs may be identified, such as the cost of books purchased by students, the cost of computer time used for graduate student research and dissertations, the cost of typing dissertations, travel, etc. These expenditures were explicitly omitted from the present study, mainly because they are relatively small and also the information would have to be obtained from individual students, while students were not contacted for any other part of the study.

Data

Site visits were made to all participating universities to gather data pertaining to the six items above for the year 1964-65. Essentially three basic categories of information were compiled; (1) student, (2) faculty, and (3) departmental. Student data were all available information on a sample of 20-25 most recent Ph.D. recipients of each department consisting essentially of transcripts, duration of graduate study, employment and fellowship data. Student data were used to derive a so-called "representative curriculum" for doctoral students of each department based on (1) the average number of credit hours earned for the Ph.D. degree, and (2) a breakdown of the total credit hours into average number of course credit hours and average number of thesis or research credit hours. In this study, costs per Ph.D. are calculated with respect to the number of credit hours earned for the degree by the student. For this reason the "representative curriculum" is essential to the cost calculations. The employment and fellowship data were used in estimating the opportunity cost of the Ph.D.

Faculty data were data on time distribution of the workweek of graduate faculty among graduate and undergraduate teaching, research, graduate student supervision, administration, and other professional activities. These data were primarily used in allocating graduate faculty salaries between graduate course instructional cost, graduate student supervision cost, research cost, and departmental administration cost.

Departmental data were current year data for each department on all relevant inputs and outputs that constitute the graduate program. The combination of departmental data, faculty data, and additional information about the university in general made possible cost calculations of all inputs utilized in graduate programs on a student credit hour basis.

Limitations

The cost estimates which follow are subject to certain built-in limitations. For this reason several aspects of the data and of the method employed in the computations deserve further clarification.

The first limitation is all components of the total cost of training a Ph.D., except the students' income and certain miscellaneous items previously described, are calculated on a cost per student credit hour basis, with respect to expenditures made and graduate student credit hours produced by a department in 1964-65. The 1964-65 cost per credit hour figures are combined with the "representative Ph.D. curriculum" derived for each department on the basis of a sample of recent Ph.D. recipients. Inasmuch as costs per credit hour are likely to change from year to year, the total cost estimate presented is neither a precise measure of the total cost of training graduate students enrolled during 1964-65 who will receive their degrees in future years, nor is it a precise measure of the total cost of training recent Ph.D. recipients, who earned their credit hours during years prior to 1964-65. A more exact cost per Ph.D. estimate than ours, which would take into account variation in prices of inputs and variation in the volume of outputs of a department, could be derived from data gathered for the entire period of graduate study of a cohort of doctorate holders. The present study was not designed to attain such duration and scope.

The estimates presented measure the total cost of training a Ph.D. under the following conditions:

(1) If the "representative curriculum" remains representative over the period of graduate study of first-year students enrolled in 1964-65.

(2) If 1964-65 costs per credit hour remain constant over the period of graduate study of first-year students of 1964-65.

(3) If the incomes underlying the opportunity cost estimates remain constant over the period of graduate study of first-year students of 1964-65.

Although it is not very likely that all of the above conditions will hold, these estimates provide new information about the total resource requirements for graduate education, and about the relative input costs as they apply to four clearly different disciplines.

The second limitation is a graduate faculty member is defined as any member of a department engaged in the teaching of graduate courses and/or the supervision of graduate students. Since most university departments do not employ separate graduate faculties, i.e., many graduate faculty members are engaged in undergraduate as well as graduate instruction in addition to a variety of other activities, only portions of salaries paid to graduate faculty members were included in the estimates. These are the portions of graduate faculty salaries that compensate time devoted to graduate instruction, graduate student supervision, research, and administration. On the average, the included portion ranged from 66 per cent to 80 per cent of total graduate faculty salaries. The excluded portion of graduate faculty salaries is that which compensates undergraduate teaching and other professional activities. The allocation of graduate faculty salaries is based on the faculty time distribution data obtained by means of a questionnaire which was designed and distributed specifically for this study.

The third limitation is that in this model the total cost of training a Ph.D. may be apportioned between two phases of graduate study: (1) the average cost of graduate course work and (2) the average cost of the dissertation. The direct costs of these two stages of graduate study are based on different sets of cost elements. The cost of the course-taking phase, for example, is based on the number of course credit hours in the "representative curriculum" multiplied by graduate faculty instructional salary cost and classroom space cost per student credit hour. The cost of the dissertation phase is based on the number of research credit hours in the "representative curriculum" multiplied by the following: (1) allocated sponsored research costs, (2) graduate faculty salaries that compensate research time and graduate student supervision time, and (3) research laboratory space costs - each on a student credit hour basis. The indirect costs, which among others include: administrative costs, library costs, faculty office costs, departmental supplies, equipment, and clerical service costs, are allocated to the two phases in relation to the number of credit hours in each phase.

Conceptual Problems Inherent in the Study

Of a number of conceptual problems encountered in the course of this study, three principal ones have been selected for discussion:

(1) The allocation of research expenditures between graduate training and research output.

(2) The calculation of income foregone by Ph.D.'s.

(3) The estimation of costs of physical facilities used in the four disciplines.

The Allocation of Research Expenditures Between Graduate Training and Research Output.

The problem of isolating the training component of research expenditures is analogous to the problem of identifying the consumption component of educational costs. Both problems stem from the fact that a large degree of "jointness" characterizes the production of education. Though it is known that most types and levels of education confer upon the student the means to a better life as well as marketable skills and capabilities, it is exceedingly difficult to estimate the so-called consumption element of educational costs. Economists to date have not worked out a solution for the consumption versus investment problem of education and have also neglected to analyze the research versus graduate training problem.

Jointness of production means that the production of one service entails the production of another. This does not imply that research can be carried out only in an academic context or that it is inextricably linked with instruction. However, it is true that training at the graduate level cannot be carried out effectively in the absence of ongoing research and a so-called research atmosphere. The complementary relationship between the process of research and the process of graduate training is most apparent in research-oriented disciplines, because for a large percentage of Ph.D. recipients in these fields research becomes the major professional activity. Even in the less research-oriented disciplines, such as the arts and humanities, scholarly investigations are frequently carried out jointly by teachers and students; in that sense the search for new knowledge constitutes an integral part of graduate education in general.

Where does this take us with respect to distributing the cost of the research-graduate-training bundle? Given the measurability of the value of the two outputs of a research project, costs might be allocated accordingly. However, an adequate yardstick for research output is not available, and measuring the amount or value of research training derived from a given project is far from simple.

In this study a breakdown was obtained for the cost of the research-graduate-training package by means of utilizing graduate faculty time distribution data. The sum of the average percentages of total faculty time spent on research and graduate student supervision were defined as total research effort, composed of research conduct and research training. A ratio was derived separately from each department's graduate faculty data in the following way:

Where:

R_c = research conduct = % of faculty time spent on research

R_t = research training = % of faculty time spent on graduate student supervision

R_e = total research effort = $R_c + R_t$

The ratio applied to departmental research expenditures =

$$\frac{R_t}{R_c + R_t} \quad \text{or} \quad \frac{R_t}{R_e}$$

On the assumption that the cost of a research project can be distributed between the research process and the graduate training process in a manner roughly proportional to the distribution of faculty time between research per se and research training, the above ratio served as a workable allocation device. The faculty time distribution data gathered for this study were such that the ratio always turned out to be less than one-half and thus less than 50 per cent of departmental research expenditures were allocated to graduate training. More specifically, the percentages of total departmental research expenditures allocated as cost of graduate training are 30 per cent in Physics, 20 per cent in Zoology, and 20 per cent in Sociology (there are no research budgets in English).

Calculation of Student's Income Foregone

When viewing graduate education as a form of human capital formation, it is in order to cite a definition of a student as a "self-employed producer of capital." F. Machlup supplies a similar definition of students as producers "engaged in the production of knowledge in their own minds." (Production and Distribution of Knowledge in the United States, p. 386). From these definitions it follows that students as students perform productive services, for the time and effort that students devote to their graduate education are as essential as any other inputs that enter into the production of Ph.D.'s. For this reason the earnings that students forego while attending graduate school are added to the other costs of a Ph.D. degree.

In this study earnings foregone by graduate students were measured as follows: Average incomes of individuals with a Bachelor's degree in each of the four disciplines were obtained from various sources.* Data on average incomes earned by graduate students in 1964-65 were

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*1. Two Years After the College Degree, National Science Foundation, NSF 63-26.
2. American Science Manpower 1962, Report of the National Register of Scientific and Technical Personnel, NSF 64-16.
3. Physics - A Statistical Handbook, American Institute of Physics, 1964.

compiled for each discipline. The difference in annual earnings of Bachelor's degree holders not in school and Bachelor's degree holders enrolled in graduate school, was multiplied by the average number of years spent earning the Ph.D. degree by a sample of recent Ph.D. recipients of each department. The opportunity cost of a Ph.D. was calculated for each department separately and is a measure which combines the earning power of the student with the number of years spent, on the average, in obtaining a doctorate in his department. The following figures show the average opportunity cost for each discipline and opportunity cost as an average per cent of the total social cost of a Ph.D. in each discipline:

Physics - $28,245 -45.9% of total social cost/Ph.D.
Zoology - $26,487 -47.5% of total social cost/Ph.D.
Sociology - $19,348 -57.0% of total social cost/Ph.D.
English - $21,523 -67.0% of total social cost/Ph.D.

The Estimation of Costs of Physical Facilities Utilized in the Four Disciplines

Three different types of physical facilities were analyzed and included with other inputs of Ph.D. programs, namely: classroom space, student research and student office space, and faculty office space. Estimates of the cost of physical facilities were derived by means of two main steps:

(1) Determining the amount of space required per graduate student, per graduate student credit hour, and per graduate faculty member in terms of square footage.

(2) Determining the annual cost of utilizing a given amount of space.

The cost aspect was handled in the following way: Since universities in their accounting procedures do not allow for depreciation as a part of current costs of plant and equipment, and since it is extremely difficult if not impossible to determine from university records the annual cost of utilizing a part of a building and its capital value, a rental rate was used for the cost estimates. Rental rates presumably include the annual return on capital value as well as the cost of operating and maintaining the facilities. A rental rate, indicative of the yearly price per square foot, either paid or charged by the university for rented space, was obtained for each institution in the sample.

Workable floor area standards for the various types of facilities utilized by graduate programs were derived from the Colorado Handbook for Faculty Planning.[1] The decision to use the Colorado space standards rather than the actual amounts of space utilized for each aspect of individual graduate programs was based on two reasons: (1) calculating space requirements in the light of certain standards seemed in some ways to be a more meaningful approach than the measurement of actual though often temporary physical facilities utilized for individual graduate programs; (2) the standards of the "Colorado Handbook" roughly corresponded to some of the targets expressed in space studies made by a number of participating institutions.

The "Colorado Handbook" presents optimal square footage per student station for a range of class sizes. The weighted average size of a student classroom station was calculated for each department on the basis of the percentage distribution of class sizes found in its graduate program during 1964-65. The size of a student station represents the amount of space needed for one class contact hour, and student station standards were combined with the space utilization rate and with the rental rate applicable to each particular university for the cost estimates of classroom space per graduate student credit hour.

The size of research facilities required for a graduate student in Physics and Zoology was derived from standards of the "Colorado Handbook" for research stations used by Faculty and Professionals, i.e., 110 square feet per graduate student in these two disciplines. For the requirement of research or individual study space per graduate student in Sociology and in English, a criterion developed for multiple occupancy office stations for teaching assistants and research assistants was adopted from the "Colorado Handbook." In accordance with this standard 50 square feet are allocated to the office station for a graduate student in Sociology and in English. The cost estimates for research space per graduate student are based on the assumption that one student station is fully utilized by a single graduate student during three fourths of a calendar year.

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[1] This Handbook is based on Report to Association of State Institutions of Higher Education in Colorado, Manual of Procedures and Criteria for Campus Development and Capital Outlay Planning, Taylor, Lieberfeld and Heldman, Inc., New York, April 1964.

The average size or standard for faculty offices was ascertained for each university separately and this information was readily available from a campus planner at each institution.

The total cost of physical facilities constituted roughly between 5.3 per cent and 14.9 per cent of the cost/Ph.D. and between 5.2 per cent and 7.7 per cent of the total annual expenditures per graduate student.

	Cost of Space as a % of Y_{ac}	Cost of Space as a % of E/S
Physics	8.3%	6.4%
Zoology	10.0%	7.2%
Sociology	5.3%	5.2%
English	14.9%	7.7%

Some Results and Data Analysis

Tables 1 and 2 contain estimates of some of the component costs and the total costs of Ph.D.'s in the four disciplines. A few comments on the data are in order.

Two sets of figures are presented for costs/Ph.D.: Y_{ac}; and the sum of Y_{ac} and the opportunity cost. The statistical analyses of the data, which follow, are all based on Y_{ac}. Y_{ac} is the cost/Ph.D. calculated with a "representative curriculum" which is characteristic of each individual department. The average Y_{ac}'s for Physics and Zoology are very close; the average Y_{ac} for Sociology is close to one-half that of the natural sciences; the average Y_{ac} for English is about one-third of that for the natural sciences.

The distribution of these percentages in Column 11 and 12 varies among disciplines (note Physics and Zoology are almost in reverse). The sum of the two percentages does not vary greatly between Physics, Zoology, and Sociology, but is somewhat lower for English.

When the opportunity cost is added to Y_{ac}, differences between costs of the four disciplines change: (1) the difference between Y_{ac} of Physics and of Zoology widens, and (2) difference between Y_{ac} of natural sciences on the one hand and Sociology and English on the other becomes narrower. Individuals with only a B.S. degree in Physics have a higher earning power than Bachelor's degree holders in the other three fields; however, they forego the fewest years of income while obtaining the Ph.D. degree.

TABLE 1. COST OF TRAINING PH.D.'S

	Number of Course Credit Hours	Direct Cost of Course Work	Number of Research Credit Hours	Direct Cost of Dissertation	Number of Total Credit Hours	Total Supplemental Cost	Total Yearly Expenditures Per Student	Y_{ac}	Opportunity Cost	Opportunity Cost Added to Y_{ac}	% of Y_{ac} That is Faculty Salary	% of Y_{ac} That is Direct Research Cost
PHYSICS												
Universities:												
A	53.5	$1,113	38.8	$29,876	92.3	$10,061	$6,496	$41,050	$22,392	$ 63,442	27.7	50.0
B	52.3	889	31.1	23,356	83.4	7,923	8,810	32,168	25,657	57,825	17.8	60.4
C	43.0	848	14.8	8,717	57.8	4,740	3,854	14,305	38,724	53,029	40.3	30.0
D	51.2	1,112	16.7	39,562	67.9	5,569	7,442	46,243	25,891	72,134	28.6	62.4
E	79.5	1,298	34.7	77,589	114.2	5,482	8,944	84,369	27,057	111,426	19.2	74.8
F	61.8	471	81.8	22,004	143.6	7,036	3,684	29,511	30,789	60,300	31.9	46.1
G	54.0	703	37.4	22,216	91.4	6,672	4,980	29,591	24,258	53,849	28.8	28.6
H	48.0	655	26.7	27,821	74.7	12,176	7,850	40,652	27,057	67,709	12.3	38.3
I	46.7	571	33.3	22,877	80.0	10,880	5,614	34,322	33,588	67,910	33.5	8.6
J	61.8	899	11.4	10,659	73.2	4,026	4,117	15,584	27,990	43,574	27.0	29.8
K	47.2	548	64.6	28,424	111.8	9,503	4,886	38,475	27,990	66,465	17.5	36.6
Average	54.4	$ 835	35.6	$28,464	90.0	$ 7,700	$6,061	$36,934	$28,245	$ 65,242	25.9%	42.3%
Weighted Average		730		$26,106		$ 7,788	$5,450	$34,623*	$28,857	$ 63,487		
% of Total		2.3%		77.1%		20.9%						
ZOOLOGY												
Universities:												
A	65.5	$1,262	44.4	$33,211	109.9	$ 8,132	$5,321	$42,605	$22,643	$ 65,248	44.1	39.9
B	56.5	4,874	42.2	33,084	98.7	29,906	5,943	67,864	24,763	92,627	32.2	32.5
C	52.2	645	29.5	21,151	81.7	4,304	6,770	26,126	23,888	50,014	55.3	32.9
D	60.3	672	23.2	16,542	83.6	4,849	4,125	22,063	27,387	49,450	52.4	28.5
E	84.5	722	43.4	33,244	127.9	3,070	4,404	37,036	24,191	61,227	60.6	32.4
F	71.4	744	67.6	11,627	138.9	5,695	4,296	18,066	24,427	42,493	48.9	26.9
G	68.2	321	38.0	16,720	106.2	2,761	5,516	19,802	31,324	51,126	42.6	21.2
H	40.3	591	48.2	37,114	88.5	12,125	8,123	49,830	35,580	85,410	24.1	31.2
I	41.9	773	39.9	21,985	81.8	13,497	8,949	36,255	24,797	61,052	27.0	3.3
J	68.5	2,345	14.0	8,260	82.5	12,623	3,968	23,228	27,051	50,279	42.5	10.2
K	63.3	586	65.0	10,205	128.3	3,987	4,680	14,768	25,302	40,070	33.2	23.0
Average	61.1	$1,221	41.4	$22,103	102.5	$ 9,177	$5,645	$32,511	$26,487	$ 59,000	42.1%	25.6%
Weighted Average		$1,178		$21,942		$ 8,811	$5,587	$31,931	$26,494	$ 58,427		
% of Total		3.8%		68.0%		28.2%						

*Average weighted by number of graduate students enrolled.

TABLE 2. COST OF TRAINING PH.D.'S

	Number of Course Credit Hours	Direct Cost of Course Work	Number of Research Credit Hours	Direct Cost of Dissertation	Number of Total Credit Hours	Total Supplemental Cost	Total Yearly Expenditures Per Student	Y_{ac}	Opportunity Cost	Opportunity Cost Added to Y_{ac}	% of Y_{ac} That is Faculty Salary	% of Y_{ac} That is Direct Research Cost
SOCIOLOGY												
Universities:												
A	63.1	$1,247	23.3	$13,211	86.4	$ 5,270	$ 4,365	$19,728	$13,009	$ 32,737	56.2	21.0
B	70.5	3,151	20.8	15,537	91.3	10,865	5,660	29,553	31,048	60,601	63.3	6.2
C	73.0	687	7.7	4,897	80.7	2,017	4,460	7,601	23,274	30,875	68.8	9.1
D	56.3	404	18.6	3,664	74.9	2,621	3,920	6,689	16,814	23,503	61.5	11.2
E	86.0	531	25.5	20,935	111.5	1,226	3,340	22,692	15,783	38,475	75.2	20.3
F	67.0	1,248	34.1	13,674	101.1	3,134	3,879	18,056	17,121	35,177	71.3	10.7
G	64.9	622	36.7	14,680	101.6	4,263	4,584	19,565	15,095	34,660	45.5	19.2
H	64.7	1,640	25.1	9,061	89.8	6,100	12,801	16,801	20,999	37,800	43.5	6.5
I	56.5	1,586	8.7	12,684	65.2	9,338	5,731	23,608	22,731	46,339	24.0	1.8
J	74.8	604	8.6	2,528	83.4	1,418	2,246	4,550	22,507	27,057	38.3	18.9
K	64.1	471	34.0	3,026	98.1	3,332	2,519	6,829	14,445	21,274	39.5	1.1
Average	67.3	$1,108	22.1	$10,349	89.4	$ 4,508	$ 4,864	$15,970	$19,348	$ 35,318	53.4%	11.5%
Weighted Average		$ 923		$ 9,777		$ 4,364	$ 4,184	$15,114	$19,238	$ 34,360		
% of Total		6.9%		64.7%		28.2%						
ENGLISH												
Universities:												
A	64.8	$ 794	29.1	$ 1,397	93.8	$ 2,064	$ 2,134	$ 4,255	$17,532	$ 21,787	65.8	2.7
B	56.1	1,178	41.4	3,064	97.5	7,313	2,399	11,555	22,099	33,654	42.5	2.5
C	71.0	506	7.2	4,478	78.2	1,642	3,019	6,626	23,342	29,968	64.5	14.9
D	61.0	410	14.2	5,723	75.2	1,955	2,626	8,088	23,562	31,650	66.6	13.4
E	97.8	1,359	29.4	6,350	127.1	8,643	1,000	16,352	23,315	39,667	37.2	14.5
F	72.9	1,541	40.3	6,045	113.2	5,094	1,693	12,680	15,960	28,640	69.2	.9
G	61.6	497	29.0	18,966	90.6	2,537	2,500	22,000	19,920	41,920	48.8	18.7
H	55.8	1,338	14.7	4,204	70.5	6,134	3,383	11,676	18,938	30,614	37.0	8.8
I	57.1	1,177	5.6	1,680	62.7	5,899	5,183	8,756	22,160	30,916	38.8	1.4
J	75.5	1,897	12.7	2,202	88.2	3,881	1,027	7,980	26,611	34,591	47.1	12.9
K	48.6	669	46.4	8,398	95.0	3,040	2,146	12,107	23,315	35,422	46.2	14.0
Average	65.6	$1,033	24.5	$ 5,682	90.1	$ 4,382	$ 3,283	$11,098	$21,523	$ 32,621	51.2%	9.4%
Weighted Average		$1,202		$ 5,768		$ 5,054	$ 3,930	$12,025	$21,956	$ 33,981		
% of Total		9.3%		51.2%		39.5%						

Interpretation

In this section selected results will be subjected to further examination and interpretation. In particular, the following analyses will be presented:

(1) A comparison of total annual expenditures per graduate student with the total cost of training a Ph.D. in each discipline.

(2) The relationship of some aspects of the cost of training Ph.D.'s to the quality of graduate departments as rated by the American Council on Education.*

Comparison of Total Annual Expenditures per Graduate Student with Total Cost per Ph.D.

Column 7 of Tables 1 and 2 on costs of training Ph.D.'s shows the total annual expenditures per graduate student for 1964-1965 in each discipline. The relationship between total yearly expenditures per student and Y_{ac} is further elaborated on in Table 3 which presents estimated time, spent on the doctorate in comparison with average actual time spent on the doctorate for each discipline. The estimated figure is derived simply by dividing total annual expenditures per student (E/S) into the total cost per Ph.D. (Y_{ac}). Table 3 shows that for Physics and Zoology the estimated time is a close approximation of average actual time spent on the doctorate. For Sociology and English, however, the estimated time is roughly one half of the average actual time. The difference in the relationships between estimated and actual time in the sciences as compared to Sociology and English is explainable in terms of the different ways in which students go about completing the requirements for the doctorate in these disciplines. In Physics and Zoology graduate students typically remain in the department until all requirements for the doctorate have been completed, whereas the actual time spent on the doctorate by graduate students in Sociology and English frequently involves several years in absentia. Thus for Physics and Zoology all actual years spent on the doctorate involve department costs whereas in Sociology and English some of the actual years spent are in effect costless for the department.

For each discipline separately and also for the forty-four departments as one group a simple correlation analysis between E/S and Y_{ac} was run, and the following coefficients of determination were obtained:

TABLE 3. RELATIONSHIP BETWEEN ESTIMATED TIME AND AVERAGE ACTUAL TIME SPENT ON THE DOCTORATE

	Total Annual Expenditures Per Student	Y_{ac}	Estimated Time for the Doctorate (Years)	Average Actual Time Spent on the Doctorate (Years)
Physics	$6,061	36,934	6.02	5.9
Zoology	$5,645	32,511	5.82	6.7
Sociology	$4,864	15,970	3.55	7.3
English	$3,283	11,098	4.42	8.3

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*An Assessment of Quality in Graduate Education, Washington, D. C., American Council on Education, to be published May, 1966.

For 44 departments: R^2 .341
Physics: R^2 .514
Zoology: R^2 .196
Sociology: R^2 .093
English: R^2 .041

These indicate that the degree of association between total annual expenditures per student and total cost per Ph.D. is by far the strongest in Physics. Physics differs from the other three disciplines in the following respects, which partly account for the higher correlation coefficient:

(1) Fewer undergraduates are enrolled in graduate courses in Physics than in the other three disciplines.

(2) Graduate courses in Physics only rarely attract graduate students from other departments.

(3) The concept of full-time student is more applicable to graduate students in Physics and is applicable to more years of the graduate training of physicists than is the case in the other disciplines.

In general it appears that the degree of association between E/S and Y_{ac} for a given discipline tends to be weakened mainly by two factors: (1) the inadequacy of enrollment data and (2) inadequacy between imported and exported graduate student credit hours.

The inadequacy of enrollment data is more specifically,

. The inability of departments to convert the number of enrolled graduate students into full-time-equivalent graduate students, and

. The inability of departments to classify enrolled graduate students by level of graduate study.

The imported graduate student credit hours are those earned by a given department's graduate students in other departments, while the exported graduate student credit hours are those produced by a graduate department for students other than its own graduate students. A surplus of imported graduate student credit hours would result in a lower E/S relative to Y_{ac} whereas a surplus of exported graduate student credit hours would result in a higher E/S relative to Y_{ac}.

Given the availability of more detailed information on graduate enrollment, on credit hour production, and on students' dissertation work which is not expressed in the form of thesis credit hours, it is probable that the degree of association between E/S and Y_{ac} would be stronger. It would then be possible to regard the estimation of E/S and of Y_{ac} as alternative approaches to measuring the cost of Ph.D.'s.

Comparison of Some Aspects of the Cost of Ph.D.'s and the American Council on Education Qualitative Ratings of Graduate Departments

The relationship between cost and quality of graduate education was examined with respect to the variables shown on Chart 3.* The departments included in this study fall into three categories derived from the American Council on Education study on effectiveness of graduate programs: (1) those not ranked, (2) "acceptable plus," (3) "extremely attractive" and "attractive." Chart 3 indicates the relationship between quality and four different variables: size, student-faculty ratio, average faculty salary, and cost per Ph.D. The relationships may be summarized as follows:

(1) In Physics and Sociology, the size of departments in terms of number of graduate students enrolled appears to be directly related to quality. This relationship holds also for English but to a lesser extent, whereas in Zoology size and quality do not seem to be related.

(2) The student-faculty ratio appears to be directly related to quality in all four disciplines, with only English showing a downward trend in average student-faculty ratio from the "acceptable plus" category to the "extremely attractive" and "attractive" category.

(3) If it is permissible to draw inferences from as limited a number of observations as are encompassed by this study, then it seems that the relationship between size, student-faculty ratio, and quality indicates a tendency towards increasing efficiency on the part of highest quality departments. This inference is further supported by the relationship between Y_{ac} and quality. This relationship shows that the average cost of training a Ph.D. in the "acceptable plus" category is higher than in the not ranked category, but that Y_{ac} is lower in "extremely attractive" and "attractive" departments than in "acceptable plus" departments in three out of four disciplines. Zoology again is the exception.

(4) All four disciplines show a consistent, direct relationship between average faculty salary and quality of graduate department.

In summary: the highest quality departments consistently pay their faculties the highest average salaries; they usually attract larger numbers of graduate students than lower ranking departments; and they exhibit tendencies towards increasing efficiency and economies of scale with respect to a higher student-faculty ratio and a lower average cost per Ph.D.

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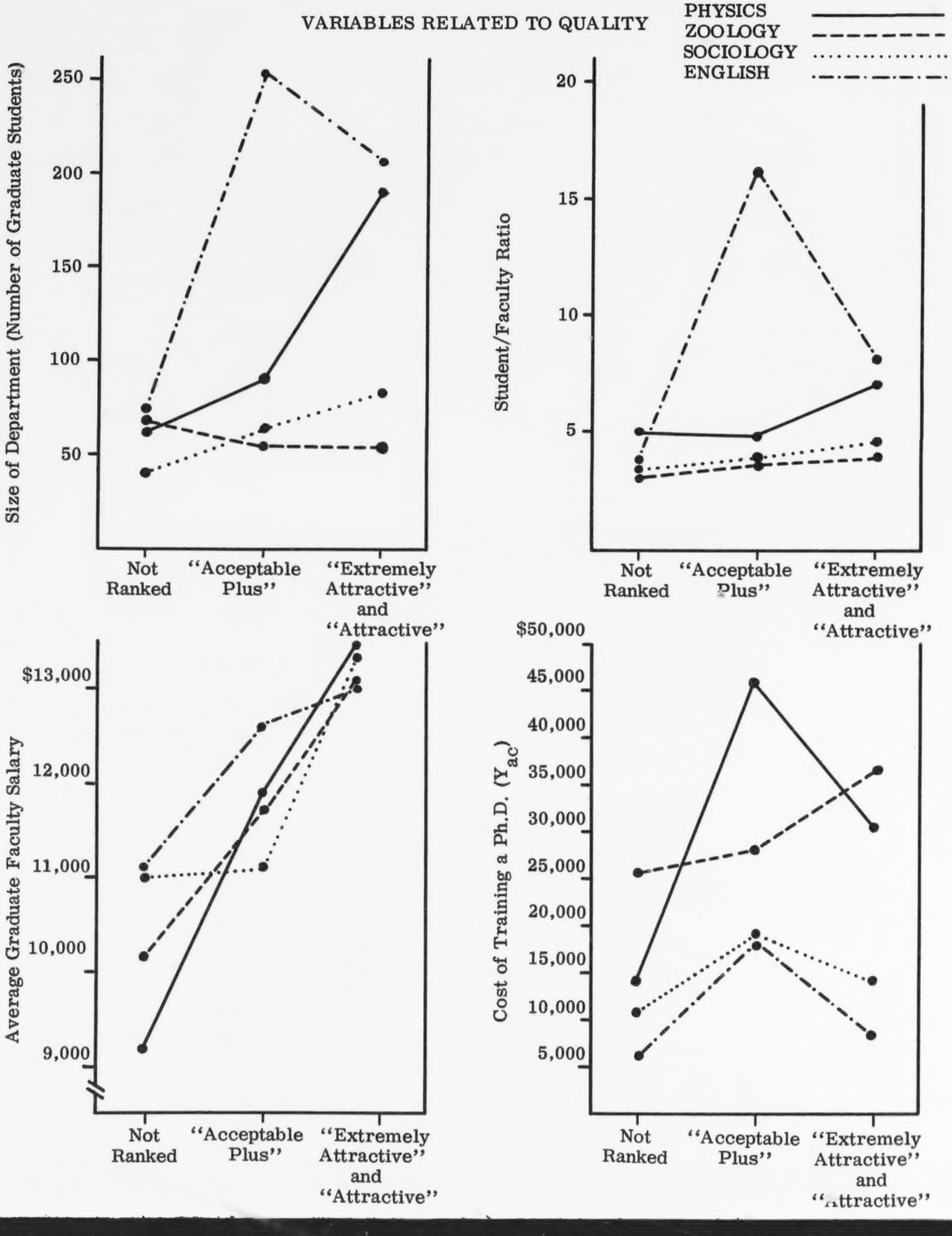
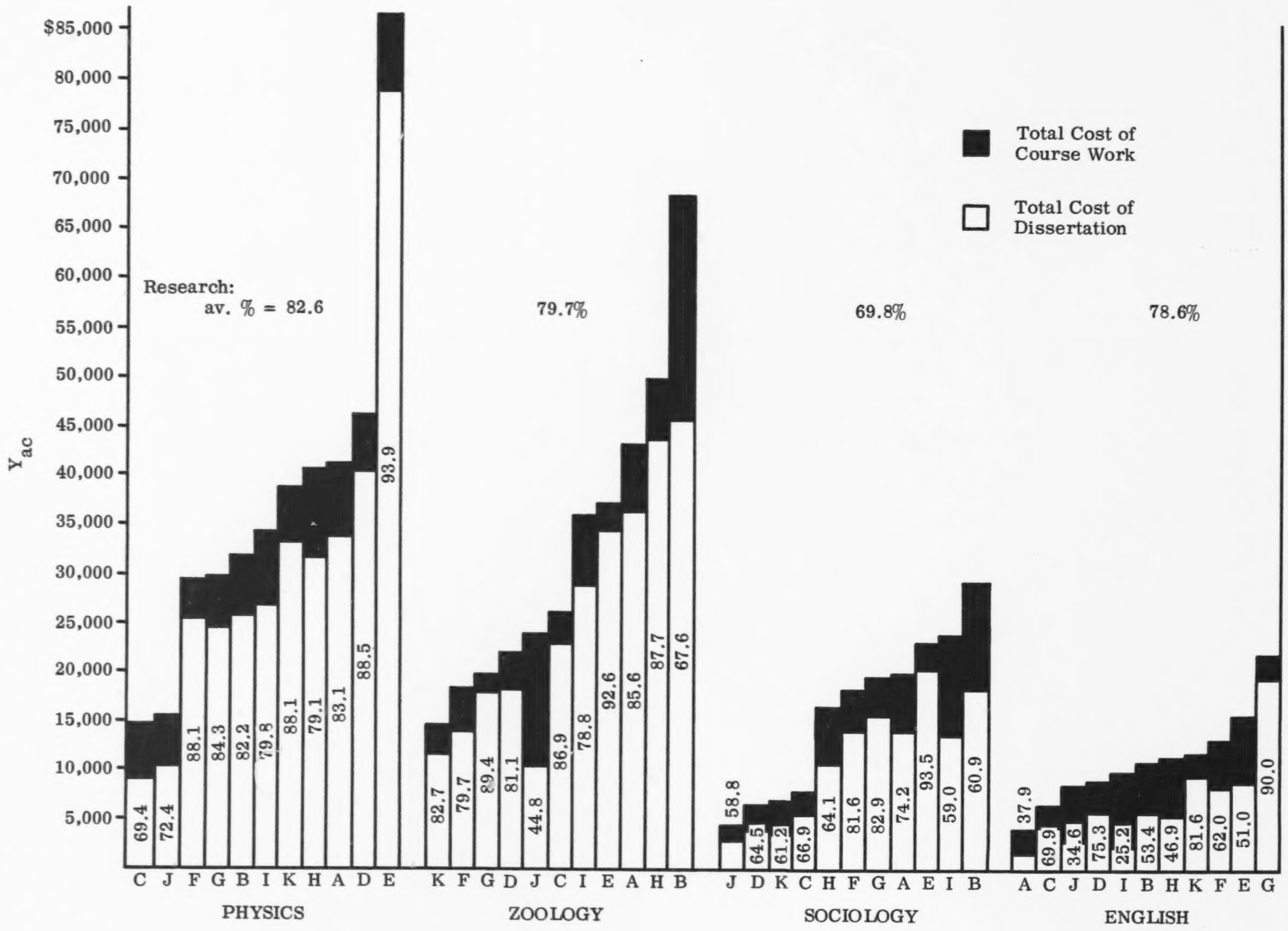
*The points on the chart represent the average level of the variable for the departments in each category. The lines connecting these points do not imply a continuous function, but rather demonstrate the trend as quality increases. The category size is as follows:

	Number of Departments in Each Category			
	Physics	Zoology	Sociology	English
Not Ranked	1	1	3	3
"Acceptable Plus"	5	5	5	2
"Extremely Attractive" and "Attractive"	5	5	3	6

CHART 3

VARIABLES RELATED TO QUALITY





Graph 1.--Cost of Training Ph.D.'s

THE MICHIGAN STUDY: GROUND FOR INTERINSTITUTIONAL COMPARISON

Homer E. Still, Jr.
Florida State Budget Commission

My reason for being here is to report on the results of a two-year project of the University of Michigan's Institute of Public Administration, undertaken with the support of the Cooperative Research Program of the U. S. Office of Education. The study was entitled FACOCUP, or "Financial Analysis of Current Operations of Colleges and Universities Project". The final report was formally accepted by the U. S. Office in April this year.

The project director, John Swanson, a past chairman of AIR's predecessor, NIRF, would be giving this report to you today were it not for the fact that he is in Lagos, Nigeria. He is there on a Ford Foundation assignment, however, and not, as rumored, in exile as a result of his efforts in this sometimes sensitive area of exploration of the finance of higher education.

The FACOCUP endeavor became, essentially, an attempt to develop "a single total framework of analysis for all institutions of higher learning, complete with concepts, techniques, language, and definitions of a universal nature that could be applied to the most diverse institutions of the present day and that also might be expected to be applicable for some reasonable future period". One of the major motives, of course, for the development of such a "single, total framework" was the desire to make possible valid interinstitutional comparison of financial and related non-financial data.

Since the allotted time is short, I may not be able to accomplish all I want to do in describing this total instrument for analysis. And I am going to begin with some substantial excerpt from the fourth and fifth chapters of the final report, sparing you the preceding description of the research procedures of the staff and of the philosophical and conceptual background against which these specifics were built, ignoring as well the more detailed analytic procedures and data described subsequently.

Framework for Analysis: Basic Body of Financial Data

Any financial information or related nonfinancial quantitative datum concerning a single institution of higher learning for a single fiscal year, term, or other unit of time is limited in its usefulness when considered alone. Such single-period, single-institution data can fall into perspective and become significantly useful and subject to judgment only when viewed either (1) in relationship to identical facets of information concerning that institution in the past or in the projected future (*historical comparison*) or (2) in relationship to identical facets of information concerning other members of the universe of which it is a part (*interinstitutional comparison*) or (3) in relationship to identical facets of information that result from hypothetical manipulation of specific institutional administrative policies or alternatives (*policy variation comparison through model simulation*). This same statement holds true for information descriptive of a subtotal portion or element of an institution, with the exception that perspective and significance can also be brought to such a datum by viewing it (4) in relationship to identical facets of information concerning other sub-total portions or elements of the institution which are in some way analogous to it in form, structure, or operation (*intrainstitutional comparison*). A fifth comparison would view data of actual operations (5) in relationship to the optima which are expressions of institutional policies (*policy deviation measurement*).

If one accepts this thesis that comparison of "identical facets of information" is essential to the process of making financial information or related data meaningful to the administrator or other user who is asked to render judgments or establish policy or make operational decisions, then those responsible for producing or using such identical facets must in some way be assured that they are indeed identically derived or abstracted and thus validly susceptible of comparison.

The development and use of a single total framework of analysis for all institutions of higher learning, complete with concepts, techniques, language, and definitions of a universal nature that could be applied to the most diverse institutions of the present day and that also might be expected to be applicable for some reasonable future period, would provide one means of such assurance. Visits to 110 institutions of higher learning across the nation demonstrated conclusively to the staff of this project that the diversity of local languages and practices in the collection of financial and related quantitative data renders impossible any valid interinstitutional comparison of the information currently produced by these institutions and in many cases cast doubt upon the validity of historical and intrainstitutional comparisons derived therefrom as well. Concurrent explorations with these institutions, searching through the literature, and meeting with consultants uncovered no single instrument of universal applicability to all varieties of institutions that might produce the desired "identical facets of information" for valid comparability. This report constitutes at least a beginning attempt to provide such an instrument.

Certain of the principles and practices of financial accounting for colleges and universities that have some widespread acceptance provide a starting point for the gross structuring of a framework for analysis of operation. College and university accounting is an evolving technology, however, as illustrated by the current efforts of the National Committee for the Revision of Volumes I and II College and University Business Administration to revise the sixteen broad basic principles of accounting enunciated by a predecessor committee in 1952. It appears, too, that there is not a high degree of consensus as to principles and good practices at any given time evidenced among college and university accountants. When there are attempts at formulation of principles and practices, these expressions invariably include significant options and permissible variations and alternatives of consequence that make possible quite diverse reflections of the financial operations of an institution "within the rules." Nevertheless, it is to the accounting function within the institution that one must turn to acquire the basic body of financial data. Thus it becomes necessary to indicate as precisely as possible the rules that are to govern the shaping of that body, and to do so without options and without alternatives, as a first step in developing a single total framework that hopefully will permit production of identical facets of information for comparison. This involves making a number of choices--some easy to make, some quite difficult, some perhaps arbitrary when the alternatives appear equally attractive. It should be emphasized again at this point that the choices made and principles selected here are requirements for comparable results from this analytic procedure only and are not intended as a critique of generally accepted accounting practices of colleges and universities.

The Modern Accounting System

An effective modern accounting system for an institution of higher learning has, almost beyond dispute, the following fundamental characteristics and elements:

Double entry methods
Asset, liability, and equity accounts
Income and expense accounts
Fund accounting structure
Classified fund groups (current funds, loan funds, endowment and other non-expendable funds, annuity funds, plant funds, agency funds)
Internal checks and controls

An accounting system with these attributes is the basic requisite of the prescribed single total framework.

Accrual Basis

The first question to be broached, upon which there has been substantial disagreement both in theory and in practice, is that of the degree of use of the accrual basis of accounting that is appropriate for colleges and universities. Without going into the reasons that have been advanced by some for use of a modified accrual basis, i.e., a policy of not matching certain elements of income and expense to each other or to the fiscal periods to which they are applicable, suffice it to say that only the full application of the accrual basis and accrual methods to current fund accounting is tenable for a universal system which would purport to produce consistent comparative interinstitutional or comparative historical financial information. A ground rule is required, then, that identifies the time or period in which income and expense elements are to be recognized: Income is to be recognized as it is earned; expense is to be recognized as it is incurred. The earning of income takes place as the stated or implied conditions attached to the payment (or the obligation to pay) are fulfilled. The incurring of expense takes place as the material or service is consumed or utilized. There are instances in which the conditions attached to the income are so minimal that all the institution must do is accept the payment, e.g., an unrestricted, undesignated gift of a sum of money. In this case the gift would become income immediately upon receipt thereof, nothing further being required of the institution in order to "earn" it. Specifically, application of the stated ground rule would include the following practices:

1. The deferring of all income collected but unearned at the end of each fiscal period to the subsequent fiscal period or periods in which it is expected to be earned. Such amounts should be credited to deferred income accounts and reflected as liabilities. Examples:

    a. Unearned student tuition or fees
    b. Unearned research grant payments
    c. Unearned restricted gifts
    d. Gifts applicable to future periods

2. The accruing of income which has been earned but not collected at the end of each fiscal period. Examples:

    a. Uncollected but earned student tuition or fees
    b. Unreimbursed research contract expenses
    c. Undistributed general (unrestricted) endowment income

3. The deferring of expenses which have been prepaid but not consumed or expired at the end of the fiscal period. Such amounts should be charged to asset accounts. Examples:

    a. Inventories of supplies and materials
    b. Unexpired or prepaid insurance premiums
    c. Interest paid in advance, or discount on notes payable

4. The accruing of expenses that have been incurred during a fiscal period but which have not been paid for. Examples:

    a. Merchandise or services received and consumed during the period for which payment has not been made
    b. Annual or vacation leave earned but not taken by employees
    c. Bad debt expense

As a practical matter, if any of the dollar amounts involved in the application of the accrual principle are truly tiny or insignificant, particularly compared to the effort and expense that might be required to ascertain the precise division between fiscal periods, they should of course be ignored, but ignored on the basis of materiality of amount, not the nature of the income or expense.

The full application of the accrual principle to institutions of higher learning would include some provision for spreading the cost of buildings, equipment and other wasting fixed assets over the useful lifetime of those assets and thus for the reflection of depreciation as an operating expense of each period. It will be noted, however, that at this point the accrual basis has been incorporated in the framework only as it applies to "current fund accounting."

Without going into a detailed consideration of this whole question of financing the physical plant, I will first give you the ground rule developed here. In order that the single total framework might accommodate the variety of financing patterns and practices, it is proposed that any and all transfers to plant funds from current funds and any and all disbursements (or obligations to disburse) from current funds for the purchase of fixed assets (whether additional or replacement) be segregated into a single classification quite definitely removed from all other current fund transactions and presented as a last item in current fund operating statements for analysis and comparison. This would include transfers to plant funds which represent the funding of calculated depreciation expense, as well as any other provisions for renewal and replacement provided the cash or other current assets are actually transferred or designated for these plant purposes.

Boundaries of the Institution as an Operating Entity

A second area in which there are not setled accounting principles or practices is that of the definition or delineation of the conceptual and fiscal boundaries of the institution which is to be described as the operating entity in the financial statements. Separate corporate identities, substantial delegations of authority and responsibility, or simply differing local concepts about what properly constitutes "the institution" result in the exclusion of organizational units or functions or activities from the accounts and statements of one institution that would be included in the statements of another. Thus further ground rules are required here in order to achieve the objective of shaping possibly varying bodies of accounting data into the single total framework for interinstitutional comparison. The basic rule here suggested is one of inclusiveness, with description of the total operating entity as the goal. For example, the following, that might otherwise have been excluded, should be accounted for under this rule as within and as part of the institution:

1. Separately incorporated research foundation that operates exclusively for, through, and because of the institution, or that is closely associated and identified with the institution.

2. Intercollegiate athletic association separately incorporated, or with its own autonomous governing body, or "run by" or "belonging to" the students.

3. Separate campus or geographically separate medical center or other major division, or separate extension activity, provided in each instance that it is an administrative responsibility of the chief officer of the institution.

4. Fund "from private sources" used at the personal discretion of an officer of the institution, e.g., president, athletic director, coach.

The rule of inclusiveness must not be carried to extremes, however. Those student organizations that may be recognized by the institution, but whose financial support and operation is the responsibility only of the participating members (fraternities, sororities, clubs, etc.), are examples of activities or entities that should be excluded or remain excluded from the body of financial data.

Constructive Income and Expenditures

Closely related to the question of what comprises the institution is a third area of concern--that of what constitutes the operating income and expenditures of the institution. In what instances are services rendered for institutions by others, services which are significant in value but which do not involve payment by the institution, to be reflected in the financial statements or in the total single framework for analysis and interinstitutional comparison? This question of the recognition of constructive income and expenditures is one relatively ignored in the college and university accounting literature except for treatment of the contributed services of members of religious orders, where there are some quite well established practices. Ideally, an instrument for interinstitutional comparison would provide for reflection of all expenses of operation of an institution and of all income, whether the transactions were of a variety that would normally be recorded in the conventional financial bookkeeping within the institution because of the payment of monies or of a variety, e.g., the provision of goods and services in kind to the institution or payments on behalf of the institution, that would not force themselves to the attention of the treasurer or accountant. Examination of instances of the latter, however, indicates that it is not always practical or realistic to attempt their valuation and inclusion. The ground rules for the framework developed here would require that the following situations be evaluated in dollar amounts and included in current operating income and expenditures:

1. State makes employer's social security contributions for all university employees from special tax sources.
2. State makes periodic contributions to funded retirement plan matching university employees' payments.
3. State provides unfunded retirement plan or benefits.
4. Members of religious orders contribute their services full-time and part-time as professionals and non-professionals to the institution.
5. Oil magnate donates in kind all fuel consumed by the institution.
6. Scholarships are made available by a corporation, an individual, or a governmental agency specifically for students to attend the institution, though the funds are not actually handled by the institution.
7. Faculty salary supplements are paid directly to faculty members by outside benefactors.
8. County pays portion of county agricultural agent's salary directly to him.

In the following instances, the ground rules require that the value or cost of the service rendered be excluded or remain excluded from the body of income and expense:

1. State provides (and requires) central disbursing of monies, all checks for institution drawn against funds in state treasury.
2. State provides central purchasing service.
3. State provides civil service or merit system personnel services (including recruiting, testing, classification, promotion determination, etc.) for certain types of positions at an institution.
4. Alumni volunteers spend thousands of man-hours in fund-raising for their alma mater.
5. Members of the medical profession in the local area contribute occasional (no more than a few hours per year for any one member) teaching services to the medical school or hospital of the institution.
6. Scholarships are granted to individual students by a corporation, an individual, or a governmental agency, with the students attending the institution of their choice.
7. State-wide body serves as governing board or as coordinating council for several institutions and is separately financed by the state.
8. ROTC instructors are military officers paid by the federal government.

Treatment of Unrestricted Income

In addition to the question of whether or not constructive income and expenditures are to be recognized, the determination of what constitutes current income and expenditures requires consideration of the question of whether income that is available to the institution for current operating purposes, but which is subsequently designated for non-current purposes, should be reported as current fund income with the subsequent reflection of a transfer to non-current funds or should simply be reflected directly as an addition to the appropriate non-current fund without going through current funds. For example, three institutions are each given a totally unrestricted, undesignated gift of a sum of money. The governing board of the first institution earmarks its gift upon receipt for the purpose of building a library. The board of the second institution accepts its gift with delight and relief that the sum provided will eliminate an impending current operating deficit for the year. The board of the third institution expresses its gratitude to the donor at the time, states that the specific purpose for which the gift should be used will be determined after due deliberation, and two years later establishes a memorial student loan fund in the name of the donor, transferring the exact amount of the original gift from the general current fund for that purpose. The nature of the gift to the institution in each instance is exactly the same. Only in the case of the second institution, however, would currently accepted accounting principles require the reporting of the gift as current fund income. In the other two instances the gift might optionally be reported as current fund income, but preference appears to be given to other treatment. The ground rule for the single total framework proposed here would require the reporting of such gifts invariably as general current fund income: Any income available to the institution for general current purposes shall be reported as general current fund income, regardless of any subsequent use, designation, or disposition for non-current purposes. Such subsequent use, designation, or disposition for non-current purposes shall be reflected as transfers from current funds to the appropriate non-current fund groups.

Transfers to and from Current Funds

A fifth consideration in determining the basic body of financial data to be used for analysis and comparison is the question of what charges and credits are to be made directly to Surplus (or its subdivisions, Unappropriated Surplus and various Surplus Reserves) and thus not reflected in the Statement of Current Operations. Apparently acceptable accounting practice today would permit the reflection of transfers to current funds (from non-current funds) and transfers from current funds (to non-current funds) either as direct credits and charges to current funds surplus in the Statement of Changes in Surplus or as transactions of the year in the Statement of Current Operations if separately indicated therein. Development of our single total framework requires a choice here. The ground rule proposed is that all transfers to or from current funds be reflected in the operating statement, separately identified therein; only those transactions which are corrections of prior year operating statements would then qualify as appropriate direct charges or credits to surplus accounts. (This would not prohibit, however, transfers between Unappropriated Surplus and Surplus Reserves, which are simply changes between subdivisions of the total surplus.)

The Fiscal Year

The fact that the fiscal year established for an institution frequently bifurcates an instructional term (most often a summer session or third trimester split by a June 30th fiscal closing) presents a sixth area of difficulty in adapting accounting data for cost analysis and comparison. Although ideally an institution would adapt a "natural" fiscal year that would better fit its pattern of instructional periods, this often is not feasible. State institutions, for example, are frequently tied, for very practical and often obvious reasons, if not through statutory or administrative law, to the fiscal cycles of their respective state governments. The single total framework prescribed here thus does not require the changing of an institution's fiscal year where this awkward situation exists, but rather requires the merging of certain financial data from the two fiscal years in order to provide complete information concerning the single instructional term.

Level of Organizational Unit for Certain Charges

Most of the expenses or expenditures of an institution using a typical accounting system will be charged to or identified with an organizational unit of some kind within the institution. For quite a variety of types of expenses, however, the practice varies between institutions as to whether the charge will fall against an institution-wide "general expense" kind of account or against the account of an organizational unit, and again, in the latter case, as to what level of organizational unit will bear the charge. Thus travel by a faculty member to attend a meeting of his professional organization would be charged by custom to a central Travel account at one institution, to a school or college level account (controlled and administered by the dean) at another institution, and to a departmental level account (controlled and administered by the department head) at a third. Before the basic body of financial data produced by the accounting system would have the comparability required for development of interinstitutional information it must be tested by and brought into conformity with this seventh ground rule: The following types of expenses should be charged to the lowest level of organization with which they can be identified, that is, to the unit "containing," at the time, the individual or the activity utilizing or being served by the supply or service or expense item:

Travel
Telephone toll calls
Postage, express, and freight
Professional memberships
Departmental memberships
Subscriptions
Office supplies
Mimeographing
Printing
Stenographic service
Equipment repair
Data processing

For an analogous group of expense items which might optionally in good accounting practice be charged either to the operating department or to a Plant Operation and maintenance account, the arbitrary rule established here is to charge all items involved in the "the provision and maintenance of indoor and outdoor space, properly conditioned, serviced and protected" to Plant Operation and Maintenance accounts rather than to the space-using departments. This would include specifically, for example:

Utilities:
  Lights and power
  Water
  Sewage disposal
  Garbage disposal
  Heat
  Air conditioning
Janitorial service
Building repair, interior and exterior
Office, classroom, laboratory remodeling
Elevator operation

Specifically excepted from the latter rule are student and faculty housing, which should bear individually charges of this nature. In the case of such housing, the direct service offered and sold by the institution is "space, properly conditioned, serviced and protected" and the costs of providing and maintaining that space are the direct costs of the service.

Framework for Analysis: The Functions of the Institution, the Analytic Categories, and the Analytic Units

Once the basic body of financial data produced by the accounting system for a fiscal year has been shaped by the application of the ground rules just described to a consistent gross content, then some prescribed uniform pattern and technique of analysis of that content is required for the development of comparative management data, whether the comparison be historical, interinstitutional, intrainstitutional, or hypothetical (through model simulation). A single framework of analysis that will serve each of these kinds of comparison is, of course, desirable. The specific such single total analytic framework described here is based on an "analytic concept of an institution of higher learning" which is described in the first chapter of the report. A college or university is viewed as a service enterprise, providing a single environment for learning, but operating through many discrete environmental units and support units that are classified into five types of services or major functions; Instruction, Research, Services to the Academic Community, and General Support. Every dollar of current operating expense of the institution is to be identified with one or another environmental or support unit in one or another of these five functions. Every dollar of current fund income is to be identified with one or another of the same five functions or else is to be classified as General Institutional Income.

Each of the five functions is comprised of a number of subfunctions or analytic categories within which the discrete environmental and support units are to be fitted, and many of the categories themselves are broken further into subcategories. The summary outline on the first page of the material which has been handed out to you (Exhibit A) presents this dimension of the conceptual framework to the first and second levels of analysis only, i.e., to the functions and analytic categories only. The subsequent nine pages contain an expanded outline down to the subcategory level, with definitions.

At this point I have not defined for you the environmental units or the support units, which are the basic entities to be identified in the institution and fitted into this outline, nor have I described the cost components of these analytic units, which for the environmental units are:

1. Direct Academic Compensation

2. Immediate Support, consisting of:

    a. Administrative Academic Compensation
    b. Non-Academic Compensation
    c. Supplies and Expense

and for the support units are:

1. Personal Compensation

2. Supplies and Expense

Nor have I described the utilization factors identified for the varieties of environmental and support units.

I may have given you already more detail than you can possibly digest. If you are interested in pursuing this topic further, I understand that there are a limited number of copies of this report, which provides a possible "ground for interinstitutional comparison", available from the Institute of Public Administration.

FREE CHOICE VS. PLANNED ACCOMMODATION:

CONTRASTING STATE APPROACHES TO STUDENT INPUT

Dorothy M. Knoell
State University of
New York--Albany

There is now what amounts to a national commitment to the goal of providing universal opportunity for education beyond the high school for all American youth. The most recent statement of this commitment appears in the report of the National Commission on Technology, Automation, and Economic Progress, titled Technology and the American Economy. The Commission has recommended that a nationwide system of free public education through two years beyond high school be established, and that no student be deprived of education at any level because of his financial situation.[1] Although the commitment is a national one, the responsibility is with the states--singly and in voluntary compacts--to devise programs and institutions in which this societal goal can be achieved. The federal government has taken a number of concrete steps to facilitate its achievement through federal funding of various financial aid programs for students (guaranteed loans, grants-in-aid, and work-study programs) and federal assistance to states and institutions in the funding of buildings, programs, and services. The government has also funded a variety of training programs for out-of-school youth for whom no suitable opportunities are now offered by the schools and colleges, e.g., the Manpower Development and Training Act programs and the Job Corps Centers. However, the particular form which universal post-secondary education is to take is wisely left to the states. As the several states expand opportunity, models are beginning to emerge which differ both in the types of educational institutions created and in their approaches to student input. Two contrasting models are the subject of this analysis.

It might well be argued that universal opportunity for post high school education did in fact exist when state universities and land-grant colleges practiced open-door admissions. Opportunity was limited only by the high school graduate's ability to pay or his initiative in finding a way "to put himself through college." Students were usually subjected to a common curriculum in their freshman year, which only a small percentage managed to survive. However, opportunity to attend college was, in a sense, open to all who wanted to avail themselves of what was offered. As demand for post-secondary education increased, particularly after World War II and as a result of the GI Bill, opportunity became restricted to an ever smaller percentage of those who applied for admission to college. Demand was underestimated to a degree which can only be termed tragic and the traditionally open-door colleges and universities were forced to become selective in their admissions, by one means or another.

Since that time, we have witnessed the phenomenal growth of the public two-year colleges--junior colleges, community colleges, technical institutes-- again with open-door admissions, locally available at low cost to the students, and (at their best) with a diversity of programs suited to students with a wide range of interests and abilities. Once again, demand for post-secondary education threatens to exceed the financial ability of the states and local communities to develop the necessary facilities. As this happens, there is danger that the two-year colleges will also restrict opportunity to the "more able," to those who are viewed as "college material." In the two state systems to be examined, the question of who is to serve the least of the high school graduates, i.e., the bottom quarter or third, is a very current one. However, the focus of the present analysis is the differing approaches to student input which have been adopted in the two states.[2]

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1. Earlier statements of the commitment appear in the 1964 Educational Policies Commission statement on Universal Opportunity for Education Beyond the High School and in the report of the President's Commission on National Goals, titled Goals for Americans.
2. A distinction should be made here between the concept of universal opportunity for post-secondary education and that of compulsory attendance through the 14th year. The latter is not expected to take place for some period of years, nor is it entirely defensible. However, it is contended that the former--the creation of a broad spectrum of opportunities for further education for all high school graduates--is now a necessity.

Issues in Student Input

There are four issues concerning student input which appear to be fundamental in state-wide planning for universal access to higher education. The first is the freedom of the qualified student to choose the particular institution, campus, and program in which to pursue his degree goals and, subsequently, his freedom to transfer to another institution if his record is satisfactory. This first freedom assumes either an open-door admissions policy or clearly stated requirements and standards for admission which the applicant must meet. It further assumes that all applicants who satisfy admissions criteria will be accommodated and that state-wide planning will anticipate the need for additional facilities before it arises.

The second issue involves the freedom of the faculty and staff of a state-supported institution to select and reject applicants in accordance with its own image of overall purpose, quality, and academic climate. Two aspects of this freedom need examination. The first is the question of how far a faculty should be allowed to go in determining the nature and quality of students to be served in their institution (when it is part of a state system of higher education). The second involves the problem of communication between the institution and its potential students, or the right of the institution to withhold information about the standards applied in screening applicants.[3] With this freedom, the decision to admit or reject particular applicants is the prerogative of the local admissions officer and/or committee, taking into consideration such factors as the high school record, test performance, extracurricular activities, and a personal interview. The second concept of freedom implies a vastly different approach to state-wide planning than the first, although they share the common goal of enabling both individuals and institutions to develop their fullest potential.

The third concept of freedom may be thought of as the property of the state. It is the freedom to manipulate, in a sense, both individual students and institutions with the goal of providing for the orderly development of opportunity in higher education for all. The state is assumed to have prime responsibility as planner, coordinator, and, when necessary, provider of opportunity, assisted in the latter role by both the independent colleges and universities and the locally controlled public institutions. This so-called planned accommodation of students is made necessary by the very real limitation on financial resources which most states face in attempting to expand opportunity so as to keep pace with need.

Finally, there is the issue of the extent of the state's obligation to subsidize the needy student in such a way that he has true freedom of choice of institution. Possible choices which are pertinent to the issue are attendance at a high-tuition private university vs. a low-tuition state institution offering the same type of program, and enrollment in a residential college located at some distance from the student's home community vs. a local community college offering a transfer program. The extreme position on this issue is that the state should enable needy students to take advantage of educational opportunity in other states (or nations) when a similar type of program is offered by the home state.[4] The subsidy may take the form of an outright grant or scholarship, a guaranteed loan with favorable conditions for repayment (or partial forgiveness), or guaranteed employment while attending college. The issue is not one of whether the student would be denied opportunity for further education because of financial need, but whether there should be any economic limit on his freedom of choice.

Other issues which are related to the four "freedoms" are, very briefly, the extent to which equal opportunity for higher education can be afforded at the local community level; the need for differentiation-duplication in levels and types of programs offered by the several institutions in each state; the provision of opportunity for upward educational mobility for capable students who are "late bloomers" or whose goals change after experiences in sub-professional programs, and for a "second chance" for students whose aspirations exceed their potential; and, finally, the promise of the comprehensive community college as the model in the extension of educational opportunity to all high school graduates.

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[3] A distinction is made between the terms, requirements and standards, which may be illustrated as follows: requirements may be the completion of a particular pattern of high school subjects with a "satisfactory" average, but the standard is a high school average of at least 75 and an aptitude score above the 20 percentile on national freshman norms.

[4] This is not a hypothetical choice since New York State permits recipients of Regents Scholarships to use their awards in out-of-state institutions.

It is inconceivable that a state could now embark upon a program of extending post-secondary educational opportunity which did not include the community college or some other type of two-year institution. It is equally improbable that any state will now depend wholly on the community college to educate all youth through grade 14, although arguments for this model are rather difficult to dispel on research grounds. In any case, the use which is made of the two-year college--the image which it is given, the functions with which it is charged, the mobility of the students who attend--is likely to vary from one state model to another. The very notion of opportunity to be offered in the community college may be interpreted variously, from giving each high school graduate a chance to attempt a university-parallel program to providing a wide range of liberal arts and occupational programs suited to the diverse needs of the students to be served. The President's Commission on National Goals estimated that the community colleges should take care of perhaps half the new freshmen who enter college each year--a goal which is already exceeded in some states. Because of the magnitude of their assignment, the two-year colleges merit considerable attention in the analysis of student input which follows.

Two State Approaches to Master Planning

New York State and California share a strong commitment to the goal of creating an educated citizenry, which is interpreted in each instance to mean that every individual should have an opportunity to develop his full potential in the educational system, without regard to his ability to pay for his education. No meaningful assessment of the fulfillment of this commitment has been made in either state but it is probably safe to conclude that both still have a long way to go. The two states were selected for analysis because of the nature and magnitude of their commitment to higher education, the diversity of their institutions, and their highly developed systems of public two-year colleges.

Both states have made their way through a series of master plans for higher education in order to provide for a continually growing college population in an increasingly complex society. Each has had some history of coordination as well as planning at the state level, including fairly dramatic changes in the pattern of organization and leadership. While there is but little similarity in the coordinating structure which has emerged in the two states, parallels can be found in complexity of the elements to be coordinated--sub-systems of two-year colleges, four-year colleges which were formerly teacher-training institutions, and a multi-campus university (which is totally different in its conception in the two states).

A similarity which is very essential to the analysis of student input is the shared assumption of the two states that universal opportunity for higher education is best achieved in a system composed of different types of institutions with differentiated functions. Both state systems include the public two-year college at their base, the liberal arts college (with graduate work through the master's degree) as a major source of teachers and kindred professionals, and a university complex at the top offering work through the doctorate and in a variety of professional schools. In this sense they differ from states like Florida and michigan which in structure, at least, have basically only two types of public institutions--two-year community colleges and universities.

Finally, New York State and California share a rather long history of public two-year colleges and an official recognition of the importance of their role in higher education. Their development has differed sharply in the two states, however. New York State has had state agricultural and technical institutes which are administered by the State University, state institutes of applied arts and sciences which disappeared as a type, and locally controlled community colleges which are rather recent in the long state history. Most of the two-year colleges in New York have been independent of the local school system from their start, both fiscally and administratively.

California history, on the other hand, has been one involving the development of a single type of two-year college which has only recently gained its independence from the local public school system. With the 1960 Master Plan for Higher Education the junior colleges of California were welcomed formally into the ranks of the higher educational institutions, while being allowed to retain a high degree of local autonomy.[5]

In both states, one of the major goals of master-planning in higher education is the accommodation of X number of students, in Y number of spaces, in Z number of institutions and/or programs. There will be groups of X's representing new freshmen, new transfer students, new graduate students, and continuing and returning students; groups of Y's for commuters, dormitory residents, engineers, liberal arts majors, and the like; and Z's which are sub-systems of public and private two- and four-year colleges with varying programs. The specific way in which the accommodation of students in available spaces in institutions is achieved in each state depends to a considerable extent on the resolution of the four basic issues involving freedom of choice. The nature of the research on student performance which is carried out in conjunction with the state master plans is also determined in part by the position taken on the various issues. The basic data which are fed into each model tend to be fairly similar--birth rates, grade-progression ratios, numbers of high school graduates, college-going rates, and in- and out-migration, together with trends and projections of each type of data. The similarity in approach stops here although the ultimate goal is, of course, the same.

The approach taken in California is best described as the planned accommodation of students in three basic types of institutions, each of which serves some specified segment of the population of high school graduates in rather clearly differentiated programs, but with student transfer between types of institutions recognized as a natural concomitant of the arrangement. New York State, on the other hand, might be described as the "scramble system" in which applicants and institutions seek each other out in an attempt to obtain a good matching of student interests and abilities with institutional profiles and preferences, using some rather informal system of communication and counseling. The state-wide admissions office of the State University of New York serves what is essentially a routine processing function. The institutions which comprise the State University are free to select their students according to locally devised, flexible standards which may include high school preparation (content and quality), test performance, ratings, recommendations by high school teachers, and a personal interview.

Admission in New York is thus at the discretion of the local institution and the student has only the freedom to apply to the institution(s) of his choice. Standards for admissions tend to go up and down with fluctuations in the student market and with increases in dormitory and other facilities. The state (in this case, State University on behalf of the public institutions) plays the role of mediator rather than manipulator, disseminating information concerning programs and institutions and the availability of spaces as the end of the admissions scramble nears each year. Some measure of control is, of course, exercised by the state as a function of approving enrollment projections for budgets and building programs. If projections underestimate demand, competition becomes strong for available spaces and standards usually rise. On the other hand, if campus facilities are over-built, standards will often be lowered in order to fill vacant spaces.

The California master-planners took the position that admissions should not be used to control enrollments in the different types of public institutions. At the same time they recommended that a deliberate attempt be made to divert new lower division students to the two-year colleges by one or another means. Studies of high school transcripts had shown that about half the graduates were eligible to enter the more than one dozen State Colleges in the late 1950's and that about 15 per cent were eligible for admission to the University's several campuses. Research on student performance led the Master Plan committee to recommend that eligibility for State College admission as a freshman be limited to one-third of the graduates (instead of one-half) and that University eligibility be reduced from 15 to 12 1/2 per cent of the graduates. Contrary to common understanding, the recommended percentages do not imply a rank-in-class standard

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[5] A comparison in depth of the development of the two-year colleges in these states is beyond the scope of the present analysis, as is a detailed description of the structures for coordination at the state level.

standard although it was assumed, of course, that the "best" students would be selected by whatever admissions standards each system established. Three positions were fixed in the proposed revision of standards, in addition to the specification of the desired percentages of "eligibles." First, the standards were to be common to all colleges or campuses in each of the systems, i.e., the State College and the University. Second, the standards were to be stated objectively, in terms that high school counselors could understand, and only a very small percentage of new students were to be admitted as exceptions to the standards. Finally, the new standards were to grow out of carefully designed studies of student performance in the freshman college year, with the objective of excluding applicants with less than an even chance for success.

The importance of the student input factor in state master-planning was underlined in the assignment of duties and powers to the new coordinating council in the California plan. The Council was instructed to obtain continuing reports of the characteristics of the students admitted to the various systems of colleges, student performance in college, retention rates and standards, and other admissions data. One of the first technical committees established by the Council was charged with studying problems of admissions and retention. In New York, on the other hand, there has been little or no state-wide attempt to assess the quality of the students now attending the various types of colleges or to relate their characteristics at entrance to their subsequent performance. The philosophy of state planning in New York appears to be one of assuming responsibility for anticipating the need for increased spaces in new and existing institutions in the years ahead, through periodic master-planning, and then of allowing applicants and colleges to seek each other out and to decide "who" should go "where" to college.

California student input into higher education is best pictured as a pyramid, with the two-year colleges providing a massive base, the State Colleges a solid middle layer, and the University the apex. The two-year colleges, now numbering more than 70, are tuition-free, open-door institutions located in the students' home communities. The State Colleges are moderately selective, charge moderate fees, and are located in some 17 centers of population. At the top, the University is highly selective, charges higher fees than its sister public institutions, and operates on comparatively few campuses. The pyramid cannot easily be separated into its three layers or segments, however, for there is a solid core of university-like students in each segment and a continuing flow of transfer students from one segment to another. The New York State model, on the other hand, tends to resemble a cube whose layers could probably be separated without grave damage to any segment and with an important extra dimension representing the independent sector of higher education. With the exception of the City University units, the public colleges all charge moderate tuition and draw, at least theoretically, from the same pool of applicants. The important differentiating factor is program, for each segment has a fairly unique level and type of program, with little planned articulation among them. There is, of course, a flow of transfer students between segments, but not in either the volume or the pattern found in California. The potential contribution of the two-year colleges in New York has been extolled in statements by both the Regents and the State University Trustees but there has been little inclination to date to seek the diversion of freshmen away from the four-year institutions or a reduction in the percentage of their students who are in the lower division.

The Two-Plus-Two Approach

The California two-year colleges are a major source of new upper division students for the State Colleges and the University. Countless institutional and system-wide studies have shown very clearly that students who begin their degree programs in two-year colleges compete successfully with native students in the upper division. There is elaborate articulation machinery in California designed to assist students in making an easy transition from junior to senior colleges. Two criticisms are sometimes voiced concerning California's two-plus-two system. One is to the effect that the junior college programs are too often dictated by the University, the other that the transfer function is too dominant over the terminal or career function. Without arguing the validity of these criticisms, it may be concluded that the California two-year colleges have enabled hundreds of thousands of young people to obtain post-secondary education of varying length and in a broad spectrum of programs. A small percentage of these students withdraw before completing a full semester; a majority terminate their formal education without transferring to a four-year college. Some continue on to advanced graduate work in the professions. The important element in the model is that there is control or manipulation of initial student input through differentiated admissions standards in the various types of institutions. However, once in, the successful student has the freedom to move from one institution to another into different levels of programs, in accordance with rather simple, clearly stated regulations governing transfer.

The transfer function of the public two-year colleges in New York State has been somewhat subordinate to the terminal-career function and, in fact, is still not performed in several of the institutions. The community college law includes a provision for transfer programs which seems like an addendum to the provision for career programs. It reads as follows, ". . . . such colleges shall nevertheless provide sufficient general education to enable qualified students who desire to transfer after completion of the community college program to institutions providing regular four-year courses. . ." The term "transfer" has tended to be synonomous with "liberal arts," despite the strong interests of career-oriented students in seeking baccalaureate degrees in various applied fields. Until recently, when the former teachers' colleges developed liberal arts programs, there was little opportunity to transfer into a four-year State University college. Instead, students attempting to pursue a two-plus-two program found their best openings in private colleges and universities or in public institutions in other states. The scramble approach to transfer admissions still tends to persist in New York, even with the development of a more comprehensive State University system. Mobility is possible and does occur but the student is usually well advised to begin his program in the institution from which he plans to obtain his degree.

A Summing Up

Two contrasting approaches to state planning to extend opportunity for post high school education have been described which represent fairly extreme models. Other models might have been chosen for analysis. However, it is assumed that there is some finite set of real and theoretical models, in terms of which the 50 states can eventually be described. The models share the common outcome of providing universal opportunity for post-secondary education, to the end that each individual will develop to his fullest potential. At the same time, the models vary in the ways in which they approach the problem of matching student and institution and program or, in broader terms, their approaches to student input.

It is hypothesized that the several states will meet with varying degrees of success in achieving the goal of offering post-secondary educational opportunity for all, in ways which are significantly related to their approaches to student input. There is clearly a research job to be done--the development of means of assessing outcomes in terms of the individual, the institution, and society; the definition of the independent dimensions of the state model; and, finally, the systematic collection of data relating to input, process, and outcomes, in terms of contrasting models. Such an undertaking should include both speculation and experimentation in a way which would involve the states which are on the move. There is no lack of data at the present time--from national studies, state master-planning, and institutional research. The lack (and the need) appears to be the grand design for describing and assessing the attempts of the several states to provide universal opportunity for post-secondary education.

SOME PRACTICAL APPLICATIONS OF RESEARCH STUDIES

O. W. Hascall
American College Testing Program

The results of research are not always put to work or find their way to the actual practice of education. My own particular profession therefore happens to be that, not of a researcher, but of a researcher's partner, one who takes the researcher's results and tries to put them to work by getting some educational decisions made that are based on the results of sound research rather than on whimsy.

Donald P. Hoyt,* in a fall, 1964, speech to educators in California said, "Education had been one of the disciplines best insulated against the effects of research, that many educators--in contrast to practitioners in the fields of medicine and other physical sciences--resist making practical applications of research, and that educational researchers themselves contribute to this dilemma because they are often motivated by all the wrong reasons, such as, to one-up their colleagues, to capture a grant, to increase their personal visibility, to avoid students, to get a degree." This means that some researchers need to form a partnership to do two things for the researchers: (1) to interpret the results of the research to educators in terms they can understand, so that the research's practical applications are immediately apparent; and (2) keep the researcher tuned-in to the kinds of down-to-earth, practical questions that educators need answers to and that can be researched. In this setting, let us consider some examples of these two functions.

The First Function: To Promote the Use of the Results of Research

To illustrate how the results of educational research can be put to use in many practical decision-making situations, let us focus on one kind of research study: the prediction of college grades. After a researcher has developed a beautiful multiple regression equation and has achieved a .65 multiple R between some predictors and college grades, what does he do with these results? Or what do his fellow educators do with them?

Here is what nearly 500 ACT colleges and universities do with these predictive data. They ask the American College Testing Program to store their multiple regression equations on magnetic tapes in computers in Iowa City. Then, when a prospective student asks that his ACT Report be sent to a particular college, the computers find the regression equation for that college and use it to predict the student's academic performance. The result appears in Figure 1.

In the case of ACT colleges, the variables in the prediction equation are 4 test scores and 4 high school grades (line 2). The median multiple R thus obtained at 329 colleges is .65 for overall g.p.a. The predictions based on this multiple R are presented on line 4. Note that this student's predicted overall g.p.a. is given for five groups. In this example, these groups are education, business administration, preprofessional, liberal arts, and engineering. Thus, Arthur Tracy is predicted to earn overall grades that will place him at the 91st percentile if he enrolls in the College of Education, at the 94th percentile if he enrolls in business administration, and so forth. In the next series of squares is similar percentile information except that these predictions are for specific subjects. In this example, the subjects are freshman English, algebra, history, chemistry, and psychology. Thus, Arthur is predicted to earn a grade in English that will be higher than 89% of other freshmen taking English, an algebra grade that will be at the 15th percentile, and so forth. The last series of squares on this line translates these predicted percentiles into probabilities of making a C or better. That is, the probabilities are 89 in 100 that Arthur will make an overall g.p.a. of C or better if he enrolls in the College of Education, and so forth. The probabilities are 72 in 100 that he will make a C or better in freshman English, and so forth. In short, the last series of squares is an abbreviated expectancy table taken directly from the college's research study.

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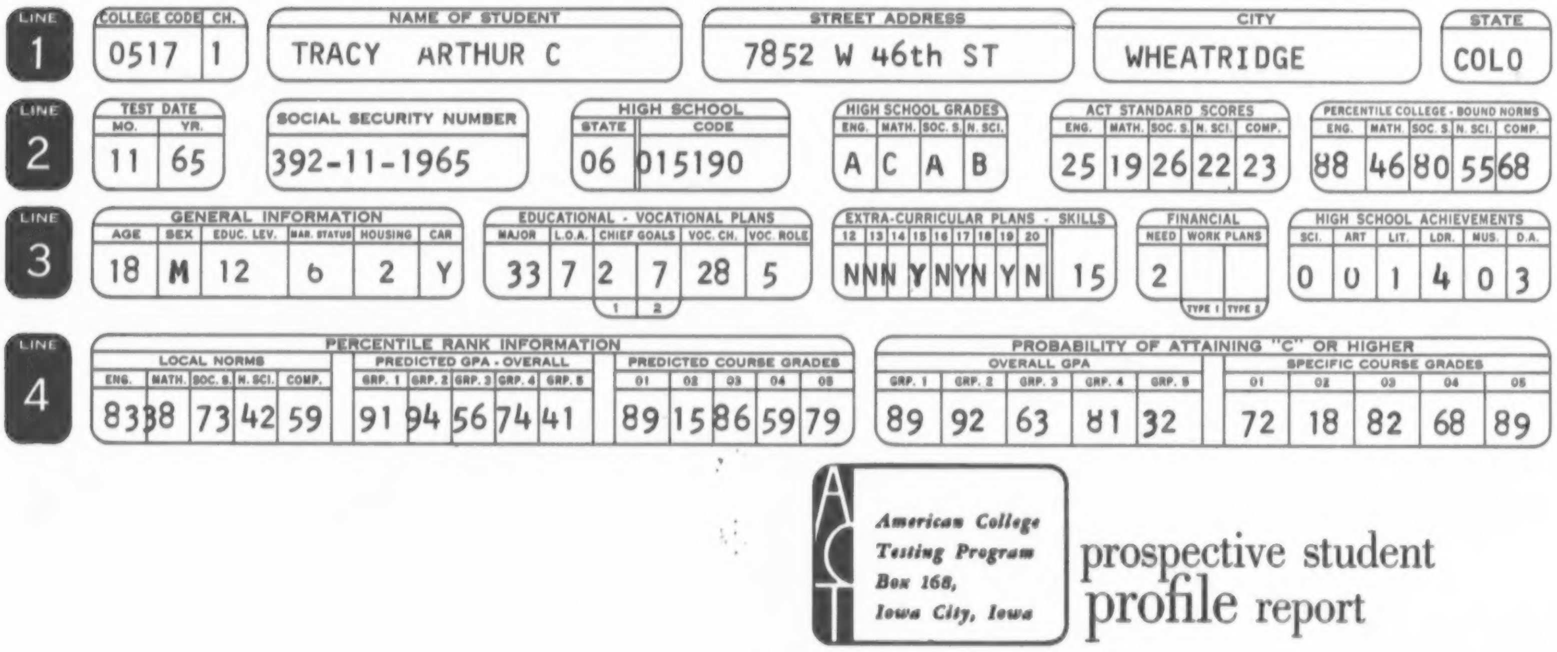
*Dr. Donald P. Hoyt, Coordinator of Research, American College Testing Program

FIGURE I



LINE 1

COLLEGE CODE	CH.	NAME OF STUDENT	STREET ADDRESS	CITY	STATE
0517	1	TRACY ARTHUR C	7852 W 46th ST	WHEATRIDGE	COLO

LINE 2

TEST DATE		SOCIAL SECURITY NUMBER	HIGH SCHOOL		HIGH SCHOOL GRADES				ACT STANDARD SCORES					PERCENTILE COLLEGE - BOUND NORMS				
MO.	YR.		STATE	CODE	ENG.	MATH.	SOC. S.	N. SCI.	ENG.	MATH.	SOC. S.	N. SCI.	COMP.	ENG.	MATH.	SOC. S.	N. SCI.	COMP.
11	65	392-11-1965	06	015190	A	C	A	B	25	19	26	22	23	88	46	80	55	68

LINE 3

GENERAL INFORMATION						EDUCATIONAL - VOCATIONAL PLANS					
AGE	SEX	EDUC. LEV.	MAR. STATUS	HOUSING	CAR	MAJOR	L.O.A.	CHIEF GOALS 1	CHIEF GOALS 2	VOC. CH.	VOC. ROLE
18	M	12	6	2	Y	33	7	2	7	28	5

EXTRA-CURRICULAR PLANS - SKILLS										FINANCIAL			HIGH SCHOOL ACHIEVEMENTS					
12	13	14	15	16	17	18	19	20		NEED	WORK PLANS TYPE 1	WORK PLANS TYPE 2	SCI.	ART	LIT.	LDR.	MUS.	D.A.
N	N	N	Y	N	Y	N	Y	N	15	2			0	0	1	4	0	3

LINE 4

PERCENTILE RANK INFORMATION														
LOCAL NORMS					PREDICTED GPA - OVERALL					PREDICTED COURSE GRADES				
ENG.	MATH.	SOC. S.	N. SCI.	COMP.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	01	02	03	04	05
83	38	73	42	59	91	94	56	74	41	89	15	86	59	79

PROBABILITY OF ATTAINING "C" OR HIGHER									
OVERALL GPA					SPECIFIC COURSE GRADES				
GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	01	02	03	04	05
89	92	63	81	32	72	18	82	68	89

American College Testing Program
Box 168,
Iowa City, Iowa

prospective student profile report

How these predictions are used can be shown by two examples. It is not uncommon for freshmen to be placed in English sections--remedial, regular, or enriched, for example--on the basis of a cutting score on an English test. With this kind of predictive information before the English sectioner, a more refined sectioning policy--based on research--is possible. For example, this kind of policy is possible: If a student has less than a 50-50 chance of making a C in regular English, he should be placed in a remedial section. Or, if he has 95 chances in 100 of making a C in regular English, he should be placed in an enriched section. Note that this policy takes into account not only how well the student did on an English test, but also his performance on a variety of other measures which previous research established as indicative of success in English at this particular college.

The second example: The College of Engineering at this university has more applicants than it can accommodate. Rather than limit its enrollment on the basis of an arbitrary rank-in-class or a test score, admission is determined on the basis of predicted g.p.a. Specifically, freshmen are admitted to this College of Engineering only if the chances are at least 40 in 100 that an overall C average will be attained. Arthur does not meet this requirement. The probabilities are only 32 in 100 that he will attain a C average in engineering. The admissions officer, with this predictive information in front of him, can advise Arthur that, although he is not eligible for engineering, he is eligible for other freshmen divisions of the university and that his chances for success there are excellent.

There are some forward-looking educators who think that, for this predictive information to be of maximum usefulness, it should be communicated to the student while he is in the process of selecting a college; he should know, early in his senior year of high school, what his chances are for academic success at different colleges or universities. As he thinks about his choice of college, he learns about the varying costs at different campuses; about the availability of on-campus dormitories; about the curricular offerings; and about a dozen other things that may influence his choice. In the same package why shouldn't an item be included about the varying grades he might be expected to earn at different colleges?

More colleges and universities than one might realize are making this information available to high school students by way of their high school counselors. The colleges and universities in the State of Minnesota were one of the first groups to make this kind of information available to high school counselors, beginning about 1960. Other states that are now publishing "Guides to Colleges" which contain tables for predicting a given student's academic performance at particular colleges in the state include Idaho, West Virginia, Georgia, Utah, and Indiana. In addition, 21 colleges in Texas have published their predictive tables in a "Texas Guide." While the Oklahoma report does not contain prediction tables, as such, its implications are similar. In addition to these state "Guides," many individual colleges and universities have released predictive tables to high schools. Notable examples are Kansas State University, the University of Montana, South Dakota School of Mines, the University of South Dakota, and Brigham Young University.

Tables 1 and 2 are taken from "Counselor's Guide to Idaho Colleges." This publication was distributed to all qualified high school counselors in Idaho during October, 1965. In addition to these predictive tables, the publication includes information about the college and the community; admission requirements; costs; scholarships, loans, and employment; personnel services; and curricular offerings. The counselor is urged to help the student consider the predictive information as a segment of information in the same way as the other sections of information are considered when the student evaluates which college will be best for him.

Table 1 provides the basis whereby the counselor can help a student see his predicted overall freshman grade average if he should attend Blank College. Let us assume this student's high school grades are English B, mathematics D, social studies C, and natural science C. By adding the weights assigned for each of these grades, plus the constant, his predicted college g.p.a. on the basis of high school grades is 1.9. Let us assume his ACT scores are 15, 14, 15, and 15. Adding the weights for these scores, plus the constant, his predicted g.p.a. on the basis of test scores is 1.7. These two predictions are then averaged for an overall g.p.a. prediction of 1.8.

Table 2 is an ordinary expectancy table that enables the counselor to translate the predicted g.p.a. into probabilities for the student. The counselor might say, "John, of the students who had scores and high school grades similar to yours who went to Blank last year, 5% of them made less than a D average; 66% less than C; 34% C or higher, and 1% made B or higher." The next step in this counseling interview might be to see what the predictions would be for John if he were to go to another college in the state. The book contains like prediction tables for specific courses (English, mathematics, etc.).

So far, we have focused on only one of the functions of a researcher's partner, namely, the translation of research studies into meaningful tools that educators will use for decision making. The remainder of the discussion will concern a second function that might be served by the partner.

TABLE 1. ACT RESEARCH SERVICE - STANDARD PLAN - SUMMER 1965

BLANK COLLEGE SUMMARY ANALYSIS

TABLE Ov 1 COMPUTATIONAL TABLE FOR PREDICTING OVERALL

STEP 1. TO PREDICT G.P.A. FROM ACT SCORES, ADD THE APPROPRIATE DIGITS FROM FIGURE 1 TO THE ACT CONSTANT (2), THEN MARK OFF ONE DECIMAL

STEP 2. TO PREDICT G.P.A. FROM HIGH SCHOOL GRADES ADD THE APPROPRIATE DIGITS FROM FIGURE 2 TO THE HIGH SCHOOL CONSTANT (8), THEN MARK OFF ONE DECIMAL POSITION.

STEP 3. TO OBTAIN THE OPTIMUM ACT INDEX, AVERAGE THE TWO PREDICTIONS.

-----------------FIGURE 2-----------------

H.S.	(GRADE) X	(REGR. COEF.)		
GRADES	ENG.	MATH.	SOC.S.	N.SCI.
A = 4	10	4	6	4
B = 3	7	3	4	3
C = 2	5	2	3	2
D = 1	2	1	1	1

REGRESSION COEFFICIENTS

	B0	B1	B2	B3	B4
ACT SCORES	0.205	0.043	0.017	0.022	0.027
H.S. GRADES	0.752	0.238	0.112	0.141	0.108

-------------FIGURE 1--------- ---

ACT	(SCORE) X	(REGR. COEF.)		
SCORES	ENG.	MATH.	SOC.S.	N.SCI.
36	16	6	8	10
35	15	6	8	9
34	15	6	7	9
33	14	6	7	9
32	14	5	7	9
31	13	5	7	8
30	13	5	7	8
29	12	5	6	8
28	12	5	6	8
27	12	5	6	7
26	11	4	6	7
25	11	4	5	7
24	10	4	5	7
23	10	4	5	6
22	9	4	5	6
21	9	4	5	6
20	9	3	4	5
19	8	3	4	5
18	8	3	4	5
17	7	3	4	5
16	7	3	4	4
15	6	3	3	4
14	6	2	3	4
13	6	2	3	4
12	5	2	3	3
11	5	2	2	3
10	4	2	2	3
9	4	2	2	2
8	3	1	2	2
7	3	1	2	2
6	3	1	1	2
5	2	1	1	1

TABLE 2. ACT RESEARCH SERVICE - STANDARD PLAN - SUMMER 1965

BLANK COLLEGE SUMMARY ANALYSIS

TABLE Ov 2 G.P.A. EXPECTANCIES IN COLLEGE OVERALL

BASED ON 4 ACT SCORES AND 4 HS GRADES
PERCENT EXPECTED TO EARN -

PREDICTED G.P.A.	LESS THAN 1.0 (D)	LESS THAN 2.0 (C)	2.0 (C) OR HIGHER	3.0 (B) OR HIGHER
3.6	0	1	99	89
3.5	0	1	99	85
3.4	0	1	99	79
3.3	0	1	99	73
3.2	0	1	99	66
3.1	0	1	99	58
3.0	0	2	98	50
2.9	0	3	97	42
2.8	0	5	95	34
2.7	0	8	92	27
2.6	0	11	89	21
2.5	0	15	85	15
2.4	0	21	79	11
2.3	0	27	73	8
2.2	1	34	66	5
2.1	1	42	58	3
2.0	2	50	50	2
1.9	3	58	42	1
1.8	5	66	34	1
1.7	8	73	27	0
1.6	11	79	21	0
1.5	15	85	15	0
1.4	21	89	11	0
1.3	27	92	8	0
1.2	34	95	5	0
1.1	42	97	3	0
1.0	50	98	2	0

CRITERION GROUP

"Overall" prediction is of average grade in all courses.

The Second Function: To Keep the Researcher Tuned-In to Meaningful Research

Too frequently, in journals of educational research, authors concentrate on communicating with each other and, in the process, overlook the live educational problems that confront the practitioner.

Let us look at an example from the field of college admissions. We hear and read much these days about the desirability of a match between the student and his college. Some of the College Guides referred to earlier make implicit assumptions that, if the right match is made, many good things will come to the student; and if a bad match is made, many bad things will surely follow. Yet there is little empirical evidence to support this kind of assumption. Parenthetically, perhaps as a result of this lack of evidence, there are some colleges which make the opposite assumption. That is, they believe that a heterogeneous mix produces the most beneficial education. My purpose is not to debate the merits of the two philosophies but to suggest that either hypothesis is worthy of the serious attention of researchers. This idea may be amplified by describing a possible research approach to it.

The ACT Program now makes available to its participating colleges a service known as the Class Profile Report. This report describes the characteristics of the colleges' students on thirty-three items. To illustrate, three of these items are given in Table 3 and present Gothic College's freshmen in terms of how they describe their college goals. Note that 45% of these enrolled freshmen named, "To Secure Vocational or Professional Training," as their most important college goal. For this proposed research study, we might categorize this large group of students as those who found a match between themselves and the college on this item. The group who named, "To Become a Cultured Person," as their most important college goal is certainly in the minority on this campus, so they might be categorized as non-typical students.

TABLE 3. MOST IMPORTANT COLLEGE GOALS

TO DEVELOP MY MIND AND INTELLECT	Local 34%	Nat'l. 33%
TO SECURE VOCATIONAL OR PROFESSIONAL TRAINING	Local 45%	Nat'l. 52%
TO EARN A HIGHER INCOME	Local 14%	Nat'l. 7%
TO BECOME A CULTURED PERSON	Local 2%	Nat'l. 2%
TO DEVELOP A SATISFYING PHILOSOPHY	Local 1%	Nat'l. 1%
OTHER	Local 4%	Nat'l. 5%

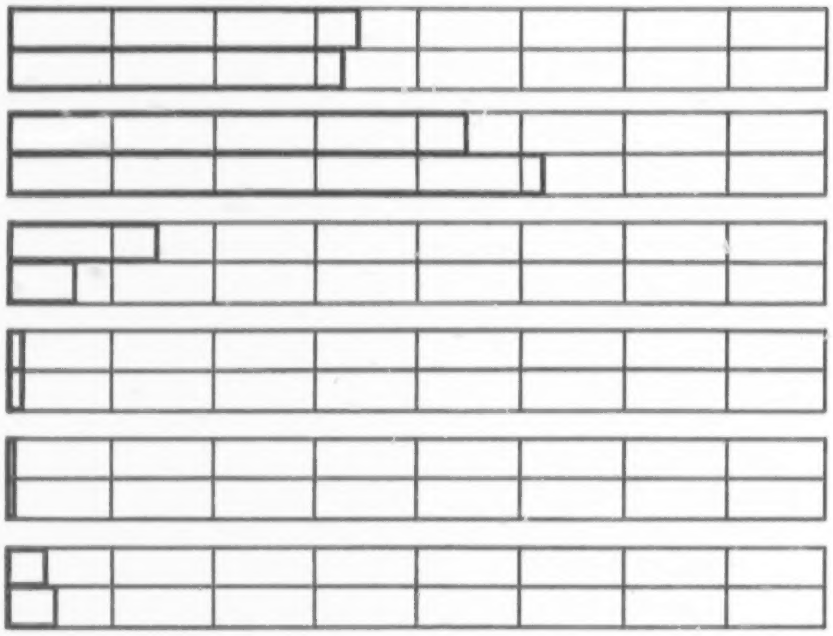


Table 4 shows the factors that were considered when choosing a college by freshmen who enrolled there. Note that the majority of these students considered "Location," "Close To Home," and "Low Cost" of major importance. Those that thought these factors were of no importance might be considered as belonging to the non-typical group on this item.

Table 5 shows the estimated family income of these freshmen. Those in the "over $10,000" categories might constitute our non-typical group on this item. There are thirty more items of this nature in the Class Profile. On the basis of these 33 items, students could be categorized into two or more groups, such as: (1) matched, (2) somewhat non-typical, and (3) non-typical on 20 or more items.

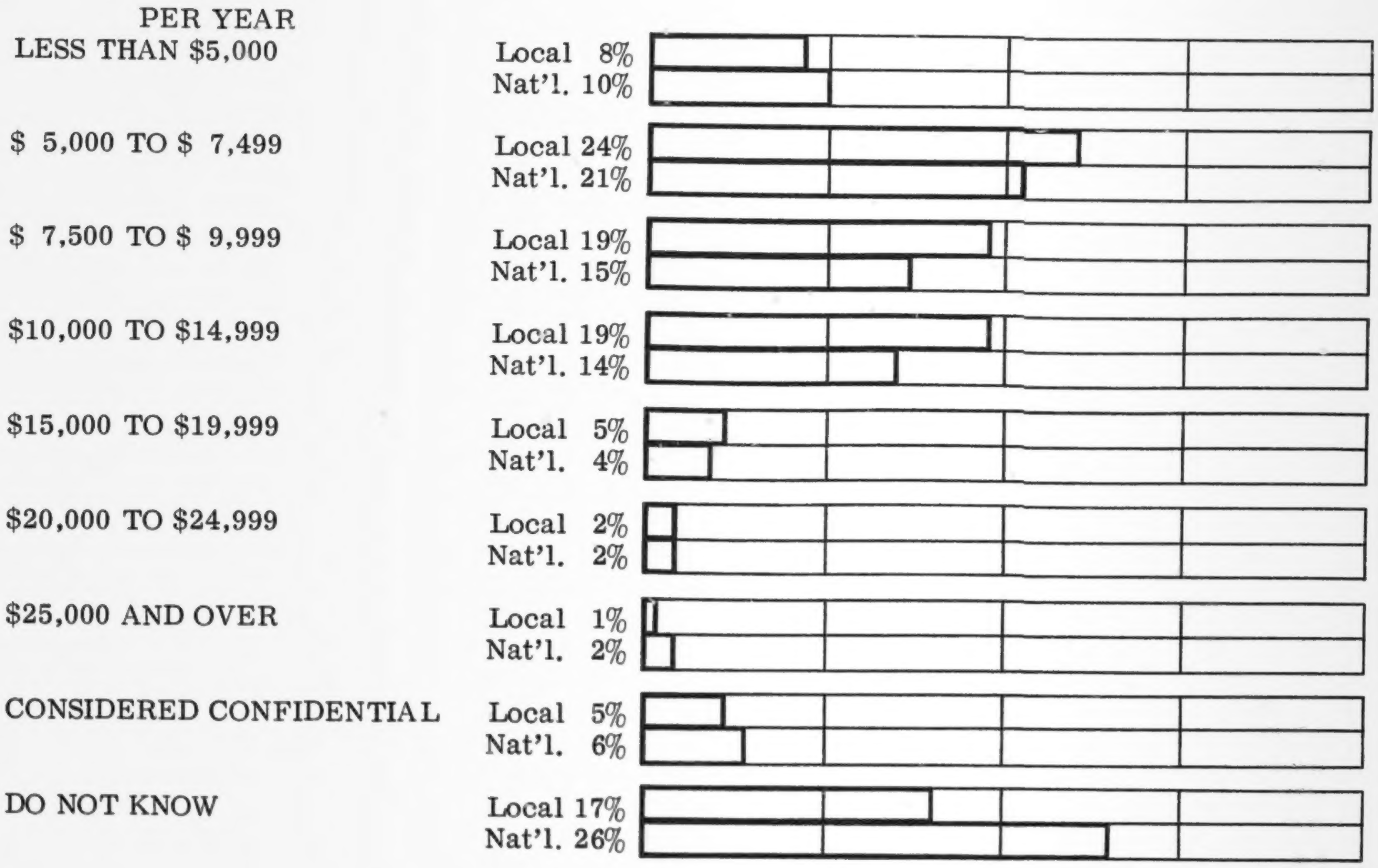
To expand the study, researchers might set up some criteria such as g.p.a., stated satisfaction with the college, persist vs. drop-out, freedom from disciplinary action, and so forth, to see if the criteria showed pluses for the matched group and negatives for the non-typical groups.

For example, if we assume that this research would show empirically that there is some logic to making a match between a student and his college on some characteristics, these characteristics of a college might be made available for high school counselors' use in the same way that the predicted g.p.a. tables are now being used in some states. Another logical step would be to try to develop special communication devices addressed to admissions officers and college counselors so that they might learn what to look for in making decisions about students and in helping students make decisions about themselves.

TABLE 4. FACTORS CONSIDERED IN CHOOSING A COLLEGE

RANK			% OF STUDENTS MARKING THIS ITEM AS ONE OF MAJOR IMPORTANCE		% OF STUDENTS MARKING THIS ITEM AS ONE OF NO IMPORTANCE
LOCAL	NATIONAL		NATIONAL	LOCAL	LOCAL
4	1	Good faculty	64	54	13
6	2	High scholastic standing	62	38	17
5	3	Special curriculum	56	38	21
1	4	Location	54	63	10
8	5	Intellectual atmosphere	42	27	27
9	6	Good facilities	41	25	30
15	7	National reputation	41	16	53
3	8	Close to home	40	60	14
12	9	Advice of parents	39	22	46
2	10	Low cost	37	62	10

TABLE 5. FAMILY INCOME



Potential research partners, such as myself and my sixteen counterparts in the United States, welcome the opportunity to be of aid to researchers in interpreting the results of research to educators and the lay public and in keeping researchers aware of the practical questions for which educators need answers.

STUDENT CHOICE AS AN INSTRUMENT OF HIGHER EDUCATION POLICY

Dan S. Hobbs
Oklahoma State Regents
for Higher Education

Until rather recently, the State of Oklahoma has been in a unique position with regard to its system of public higher education. While most states have been hard-pressed to build enough new institutions to keep up with burgeoning student enrollments, Oklahoma has had a surplus of colleges and universities, almost to the present hour. This surplus was brought about almost overnight in the early and dynamic years of Oklahoma's history, which saw 20 public institutions of higher learning created by the territorial and state legislatures between 1890 and 1910. Colleges and universities were strewn so liberally about the prairie landscape that the original citizens of the state had access to universal higher education even before universal secondary education became a reality in the 1920's.

In an educational economy marked by an excess of institutional supply over student demand, a fierce spirit of competition has sometimes operated within the state, with all institutions actively competing for the same limited number of students and the same scarce resources. As a partial consequence of this competitive environment, student costs have remained relatively low and an open-door admissions policy has been maintained by all public institutions until very recently.

Since Oklahoma high school graduates have historically been free to choose which colleges and universities they would attend, particularly in the public sector of higher education, and because 80 per cent of Oklahoma's college students have chosen to enroll at public institutions, the state offers an ideal laboratory in which to study the effect of free student choice on the functioning of a public higher education system.

Study of the 1962 Freshman Class in Oklahoma Colleges

In the fall semester of 1962, the Oklahoma State Regents for Higher Education began a six-year study of the first-time-entering freshman class in all of the 32 colleges and universities--both public and private--then operating within Oklahoma. Each first-time freshman who enrolled in September of 1962 was asked to fill out a four-page questionnaire, giving such information as sex, age, size of high school graduating class, high school grade average, estimate of parental income, career expectations, and other like information of educational and socio-economic significance. The ACT Composite Standard Score was supplied as an academic aptitude measure for more than 90 per cent of the students.

All of the individuals who were in the initial 1962 group have been followed on a semester-by-semester, name-by-name, and institution-by-institution basis. Attrition and retention rates have been compiled for each institution, as well as transfer and re-entry data.

One publication has already emerged from this longitudinal project, and two additional reports are now in progress. That first publication, In and Out of College, (Coffelt and Hobbs, 1964) recorded the progress of the study group through the freshman year. The great majority of the material contained in this paper was initially presented in that report.

Characteristics of College Freshmen

In the fall of 1962, a total of 13,326 first-time-entering freshmen enrolled in 32 Oklahoma colleges and universities. The ratio of men-to-women in that class was approximately 60:40, which means that there were proportionately more men in the Oklahoma freshman class than in the 1962 national entering group, whose ratio of men-to-women was 58:42 in that same semester.

Based on the manner in which they stratified themselves in the various types of institutions, Oklahoma students apparently perceived the junior college as "masculine" in type, the four-year college as "feminine," and the university as an institution for men and women alike.

The highest concentrations of men occurred in the junior colleges, where the male-to-female entering ratio was on the order of 70:30. Five of the junior colleges showed a male-to-female ratio in excess of 80:20 in that semester. Students' perceptions of the two-year college as a masculine type were apparently confined to Oklahoma, since two-year colleges in the nation enrolled proportionately as many women as did four-year colleges and universities. A partial explanation for this inordinately high percentage of men in the junior colleges lies in the fact that five of them carry the name "Agricultural and Mechanical" as a part of their official titles. Although the "A & M" designation is no longer descriptive of the educational activities being carried on in these colleges, it is clear from this analysis that the institutional image of the junior college has been firmly fixed in the minds of the general public as single-purpose and terminal, rather than comprehensive in nature.

The four-year colleges in Oklahoma enroll a relatively high percentage of women as compared to men, primarily because the majority of these institutions were formerly teachers' colleges. Since teaching is generally regarded as a feminine occupation, it is not surprising that a relatively high percentage of women attend four-year colleges. As these institutions outgrow their "teachers' college" image, the ratio of men-to-women will gradually become more like that of the state as a whole.

A highly interesting sociological observation could be made at this point. Whereas the men in the white freshman population outnumbered the women by a ratio of 60:40, the ratio of men-to-women in the Negro freshman population was 49:51. This same phenomenon was observed by Stroup and Andrew (1959) in a 1957 Arkansas study. It has been suggested by one Negro educator that the reason for this aberration lies in the matriarchal structure of the Negro family. Since the head of the household in a great many Negro families is the woman, and since higher education is perceived in essentially economic terms, more Negro women than men go to college in order to prepare themselves for their role as head of the household and breadwinner. This finding suggests the need for a creative scholarship program which would encourage more capable Negro men to continue their education beyond the high school.

Input by Type of Institution and Control.--As in most western and southwestern states, the publicly supported institutions of higher education in Oklahoma predominates in terms of students enrolled. More than 80 per cent of the first-time-entering freshmen enrolled in Oklahoma colleges in the fall of 1962 were on the campuses of state-supported colleges and universities. Freshman enrollment by type of institution showed 40 per cent in universities, 40 per cent in four-year colleges, and 20 per cent in the junior colleges. This stratification of Oklahoma freshmen by institutional type differs from the prevailing pattern at the national level, where the junior colleges have made such rapid gains over the past few years. It is not the junior college, but the four-year college and the university which have garnered the greater numbers of first-time-entering freshmen in Oklahoma.

In connection with this enrollment pattern, it was found that the more education possessed by the parents, the more likely a student is to choose a university-type institution for his initial enrollment. The opposite also holds true at the other end of the spectrum: The less formal education possessed by a student's parents, the more likely he is to enroll in an Oklahoma junior college.

This finding presents a problem in terms of future policy at the state level. If the level of parental education continues to rise each year, and if parents who have had some exposure to higher education continue to point their children toward universities and four-year colleges, we cannot hope to develop a viable system of comprehensive, open-door junior colleges within the state unless the various types of institutions become more differentially selective than they are at present. It is very doubtful whether any states will in the future be able to maintain the principle of free choice--either for their students or their institutions. Instead, it appears almost certain that any state which desires to provide advanced education for all high school graduates will be required to adopt the principle of planned accommodation, whereby different kinds or levels of students are accommodated by different types or levels of institutions.

Academic Aptitude of Freshmen.--In terms of academic aptitude, as measured by ACT scores, universities in Oklahoma enrolled students whose academic ability was substantially above that of students in four-year and two-year colleges, particularly the state-supported colleges and universities. Only six per cent of the freshmen at the two state universities ranked in the bottom quartile of all high school students nationally, and more than 50 per cent of them ranked in the top quartile. The ability profiles of the four-year and two-year institutions were remarkably alike, and both strongly resembled typical high school classes nationally, with approximately one-fourth of their students in the bottom and top quartiles, respectively.

The median ACT score of freshmen at the state universities was 21, which placed half of these students at or above the 80 percentile of the twelfth grade population of the United States. The median ACT score of freshmen at the four-year and two-year state institutions was 16, which placed half of their freshmen at or above the 50th percentile.

When the median ACT scores for students in the 1962 freshman class in all Oklahoma colleges are compared with national college-bound norms on the ACT, Oklahoma institutions appear to be much less selective than institutions as a group nationally. The median ACT Composite Standard Score for national college-bound students was between 20 and 21, whereas the median score for Oklahoma freshmen was between 18 and 19.

One of the reasons for Oklahoma's relatively poor showing on college-bound norms is due to the high proportion of its high school graduates who go on to college. Oklahoma ranks near the top among the states in this regard. It is to be expected therefore, that with a higher-than-average proportion of its college-bound population in college, the state would not come up to national norms for college-bound students. This is not to suggest that Oklahoma college freshmen would be at the national norm if a lower proportion of its high school graduates went on to college; however, the state and national norms might be closer if such were the case.

The great diversity in the ability levels of Oklahoma college students is illustrated by the fact that in the institution whose students score highest on standardized college aptitude tests, half of the entering freshmen rank in the upper 15 per cent of the national high school graduating class, whereas in the institution whose students score lowest on standardized tests, more than half of the entering students rank in the lowest 15 per cent of high school seniors nationally. Among other things, this means--at least in terms of academic aptitude--that the dropouts from the one institution are likely to be more intellectually capable than the graduates from the other.

The great spread in the ability levels of students in the same State System poses a number of problems in terms of both curricula and academic standards. If one institution--the majority of whose students rank in the lower half of the distribution--graduates a higher percentage of its students than another institution--the majority of whose students rank in the top half of the distribution--what are the implications with respect to the value of the respective degrees held by students who are graduates of these institutions? This is but one of the many problems which arise in the same context.

A few of the more interesting sidelights in connection with academic aptitude scores are these: (1) Men score higher by one standard score on the ACT test than do women, although women come to college with considerably higher high school grades than do men. (2) Students with athletic scholarships score less well on the ACT test than the average student at the institution awarding the scholarship. However, athletes at the state universities score higher than do average students at the state four-year and two-year colleges. Thus an athlete who is considered relatively dumb on a university campus would be well above average if transplanted to another type campus. (3) Fraternity and sorority members not only score higher on academic aptitude tests than the average student, they also remain in college at much higher rates. (4) Students who are planning to major in physical science, mathematics, engineering and medicine score highest on academic aptitude tests; those who plan to major in agriculture, elementary education. business and home economics score lowest. Those students who plan to make teaching their career score well below the group which does not plan to teach. (5) Students from large high schools do much better on academic aptitude tests than do students from small high schools. In 1962, some 42 per cent of the college freshmen from high schools with 100 or more graduating seniors scored in the top quartile on the ACT test. By comparison, only 21 per cent of those from high schools graduating fewer than 25 students scored in the top quartile.

The Impact of Continuing Input on Institutional Size

It would not be incorrect to say that the overwhelming majority of research on student input has been concerned with initial input--that is, input at the freshman level. Although the number of studies done in the general area of admission-retention-graduation are legion, the scope of such studies has typically been quite narrow. Most institutional studies on admission and retention concern themselves only with the students who enroll at a given institution as first-time freshmen, and who persist to graduation at the original institution four or five years later.

Even though an institutional study of this type provides the individual college or university with some measure of its own efficiency and productivity, its sociological value is limited, since an institutional study does not usually take into consideration the numbers of its own students who transfer elsewhere and graduate, nor does it typically involve the students who transfer in from other institutions. With the rate of mobility among modern college students increasing, any study of input and output which does not take the transfer factor into consideration is calculated to understate the rate of gross retention in the society by 25 per cent or more.

The size and prestige of an institution typically bear close relationship to each other, size being closely related to an institution's operating budget, and most colleges and universities find themselves busily involved in the matter of student recruitment, like it or not. Most of this recruiting activity, or public relations work, as it is euphemistically referred to, is concentrated at the freshman level. This may or may not be sound. Many institutions apparently do not recognize that the factor of continuing input may account for as many students in a given senior class as the factor of initial input.

Let us examine the impact of initial and continuing input on several institutions from the freshman to the senior year. At one of the four-year colleges in the Oklahoma State System, continuing input is of no consequence whatever--only four per cent of that institution's senior class is made up of transfer students. In two other State System institutions, however, transfer students account for more than 40 per cent of the senior class. It is quite possible that in one of these institutions, the number of home-grown graduates will be equaled or exceeded by those students who began their programs elsewhere.

It is a fairly common technique for institutions to calculate their student retention rate by means of what is called the "cohort-survival" method. That is, a college will take the number of seniors who are graduating in a given year and will go back four years earlier to see what per cent of the freshman class persisted to graduation. For some institutions, this gives a fairly close approximation; for others, it distorts the true situation considerably. Unless the number of students who have transferred in from the outside are excluded from these calculations, no meaningful retention data can be obtained. A look at what actually happened in two institutions will illustrate the point.

In the fall semester of 1962, Institution A, a four-year college in the Oklahoma State System, enrolled a total of 1,052 first-time-entering freshmen. In 1966, four years later, that same institution enrolled 550 seniors, a number of students equivalent to one-half of the original freshman class. However, only 317 of those 550 students, or about 30 per cent of the original number, had been in attendance at that same institution four years earlier--the other 233 students had transferred in along the way. Thus, what appears at first glance to be a retention rate of 50 per cent from the freshman to the senior year turns out to be a true retention rate of only 30 per cent.

Another four-year college, Institution B, enrolled 201 first-time-entering freshmen four years ago; this past fall, that institution enrolled a total of 114 seniors, or slightly more than 50 per cent of the original entering group. Unlike Institution A, however, this institution had very few transfers--only four students from other institutions are presently included in that senior class.

The implications of continuing input on institutional policy and practice are of considerable magnitude. A college which grants as many degrees to transfer students as it does to students who have been enrolled in the same institution for four years is heavily dependent upon other colleges to furnish the general education for its graduates. This kind of institution should therefore be as interested in the general education patterns of other institutions as in its own lower division sequence. Also, an institution which drops out large numbers of its own freshmen and then replaces them with transfer students should look at its own program carefully to see whether its lower division standards are not too demanding, and perhaps to inquire as to whether its upper division standards are demanding enough. Also, an institution should be aware of the kinds of students which are being dropped out and the kinds that are being picked up to replace them: It is quite possible that some colleges may be routinely dropping out a higher quality of students than they transfer in. Our study shows that this is not just a possibility--but a reality in at least two separate instances.

Observations on Student Input and Institutional Self-Perception

We observed previously that the four-year and two-year colleges in Oklahoma were remarkably alike in terms of the academic aptitude scores made by their students. This was not what the researchers expected to find at the beginning of the study; neither was it what the people in the institutions expected. Instead, it was hypothesized by those in the four-year colleges that their students would be much more like those in the universities than those in the two-year colleges. The opposite turned out to be true. Not only did the students in the four-year colleges score like those in the junior colleges on aptitude tests, but they also turned out to look like them in terms of other characteristics such as parental income.

This finding would seem to suggest that the state-supported four-year colleges are serving a junior-college, rather than a baccalaureate, function. For many of these colleges, that appears to be the case. For example, in the largest of these institutions, more than 70 per cent of the student-credit-hours produced in the most recent analysis was produced at the lower-division level. In four other institutions, more than two-thirds of the production was at the lower-division level.

This was only one of the instances in which institutions' self-perceptions were not congruent with the actual situation Another revelation which came as a distinct shock to some of the institutions--particularly to some of those in the two-year colleges--was the discovery that the universities as a type had a retention rate higher than that of any other institutional type. This came as a surprise to many counselors and teachers in the junior colleges, many of whom believed that the excellent counseling and teaching done in the intimate environment of the two-year institution resulted in a lower attrition rate than that compiled by the larger, and hence more impersonal, universities.

A related finding, and a totally unexpected one, was that which showed the two-year institution with the lowest median aptitude level to have the highest retention rate of any two-year college through the first year of the study. The same thing occurred in the four-year group of institutions: The college whose students scored lowest on the ACT retained the highest percentage of its freshmen. Needless to say, these statistics created no small stir among the state-supported family of like institutions.

What's In a Name? The point was made earlier in this paper that the name of an institution is an item of some importance, since a number of people form their entire impressions of an institution on that basis alone. As indicated previously, the "A&M" junior colleges in Oklahoma have expressed an interest in dropping that designation from their official titles, since it appears to depress their female enrollments by 10 to 20 per cent. Also, there is a move underway to remove the name "Junior" from the official titles of two-year institutions, not only in Oklahoma, but across the nation as well.

The most active trading in the name-changing market at the present time is not occurring among junior colleges, however, but among four-year colleges, many of whom want to call themselves universities--often without changing their functions to accord with their new titles. There is nothing wrong with this practice--it is merely the institutional equivalent of social climbing.

Conclusion

One of the major purposes of the State Regents' study of the 1962 freshman class in Oklahoma colleges was to develop and publish information which would help to bring students and institutions together in the right combinations. T. R. McConnell had suggested such an approach in a speech delivered at the Sixty-Sixth Annual Meeting of the North Central Association of Colleges and Secondary Schools. At that time, he urged the publication of distributions of freshman scholastic aptitude scores so that students might know what they were getting into when they enrolled at a given college or university. "Not until we provide objective consumers' guides to higher education," Dr. McConnell (1961) said, "will we be able to aid students to choose suitable institutions."

We believe that it is not only possible, but eminently practical to give students, parents, and high school counselors access to the kinds of information which heretofore has been the privileged property of colleges and universities. If students are going to be allowed to make choices --and they are--then they need information. As my colleague John Coffelt has said, "It is better that students make choices on the basis of information they might misinterpret, than to choose blindly on the basis of no information at all."

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FACULTY SELECTION IN PROTESTANT COLLEGES

L. Richard Meeth
Baldwin-Wallace College

The Market for College Teachers by David G. Brown (1965) does such an effective job of summarizing the factors of faculty input that there is little else left to report. However, one group of colleges, namely the church-related liberal arts institutions, must consider an additional factor unique to them. The religious attitudes and practices of these colleges greatly affect the policies by which they recruit, select, develop, and retain faculty personnel. This paper reports a descriptive study of the importance of religion in faculty selection in Protestant liberal arts colleges (1963).

The great majority of the 128 responding institutions ranged between 500 and 1,500 students and were fully accredited by their regional agency. In 72 per cent of the colleges, fewer than 60 per cent of the faculty and staff were related to the denomination with which the college is affiliated, graphically demonstrating statements by the schools that they are little concerned that faculty members belong to their own denomination.

Faculty Selection Policy

Selection policies in church-related colleges range from the most stringent restrictions to no regard for religious convictions. One college, representative of several, states, "Ours is a unique situation since our college is not only church-related but also church-supported. All of our staff members must hold membership in the supporting church body." Some schools maintaining this position go further to assert that all faculty be theologically trained by the denomination in order to hold teaching positions.

Other colleges which also receive considerable support from the denomination with which they are affiliated limit their faculty to Prostestants. The dean of one institution with strong denominational control says, "Under the By-Laws of our college charter, we are currently allowed to employ as regular members of the faculty only those who are members of some evangelical church. In view of our relationship with the church, we are adhering strictly to this principle."

Another dean, moving away from specific denominational affiliation, comments, "We seek faculty members who are sympathetic with the religious principles of the denomination which sponsors our school. Since our denomination does not specify any strong doctrinal positions, this really amounts to a willingness to teach within the framework of a church-related college." Sympathy with denominational principles and membership in an evangelical Protestant church are poles apart in practical application because the criterion of judgment shifts from an individual's personal religious feelings to an observable church membership.

Going even further toward individual religious convictions as criteria for the teaching discipline, one board of trustees states its position:

> "We are anxious to stimulate the theological conversation on campus which involves a variety of interpretations within the framework of the Judeo-Christian faith. The academic freedom which we practice places upon us all the privileges and even the obligation to let our students know what our religious convictions are, without compelling them in any way to agree, but stimulating them to develop and defend their positions."

This position, midway between theological training for every teacher and no religious concerns at all, is held by the largest group of colleges in the sample.

By far a smaller number agree with the dean who says, "To me, 'church-relatedness' finds its uniqueness in the ability of our faculty to really care about individual students--to be genuinely interested in 'lifting up' those students who need lifting--to suffer with those who suffer--

that they may feel like whole personalities rather than nonentities as can be the case in gigantic universities. Of course, we do not succeed in this, but we try.'' His position requires no church affiliation whatever, only a concern for students.

Immediately the question arises, ''Who determines whether or not a prospective faculty member really is concerned about students?'' Is it part of the administration's responsibility in hiring? The president of one institution replies, ''We tell all candidates that they should have an understanding of and a respect for the Christian commitment of the college. They are asked to read the statement of principles and objectives found in the Faculty Manual and decide for themselves whether they can in good conscience join the faculty. The decision is theirs. We do not presume to judge.''

Many colleges expressed this unwillingness to pass judgment on the religious persuasions of prospective faculty even though the deans felt that religious criteria in faculty selection and retention were important, especially the ability to articulate a living faith in a teaching field. A summary by deans in various colleges cites the following reasons for letting each individual judge his religious convictions for himself:

1. The professor specialist is often the only member of a small college community who is in a position to evaluate validly his religious attitude as it may be related to the subject matter of his teaching field.

2. The difficulty of obtaining qualified candidates is on the increase which means that persons combining desirable religious traits with scholarship and teaching ability are at a premium. Consequently, the selection of faculty often dictates its own terms, particularly if there is a limited budget allocation.

A final extreme selection policy held by very few institutions can be summarized by the casual remark of one president, ''We have no written policy regarding the religion of faculty; in fact, we don't even have a standardized unwritten policy.'' This position, just short of complete disregard for religion in faculty selection, expresses one extreme limit of institutional policy.

Ten items most often mentioned as being important criteria in faculty selection in church-related colleges were presented to Protestant college deans. They ranked them in the following order:

1. Intellectual ability and scholarship.
2. A great capacity for, skill in, and devotion to teaching.
3. A genuine concern for persons.
4. Devotion to a free search for truth.
5. Interest in a vital relationship between religion and the teaching field and their relevance to modern life.
6. A sense of Christian community and citizenship.
7. Leadership in the teaching field.
8. Open-mindedness about religious matters.
9. Personal religious orientation in the tradition of the denomination.
10. Personal practice of the religious convictions of the denomination with which the college is affiliated.

While the hierarchal distinction between items next to each other is statistically questionable, the rank order does protray the general relationship of accepted faculty selection criteria, in terms of the items listed. Those at the upper and lower limits of the table reveal an accurate estimation of the important and unimportant criteria in faculty selection.

The composite response to the questions on religious criteria for faculty selection leans toward the importance of the individual's free exercise of judgment in religious matters rather than toward his being judged by college administrators. This occurs partly because the largest number of colleges in the sample are of this persuasion and partly because, as one president said, ''It is the Protestant tradition.''

Seventy-one per cent of all respondents felt that the ability of a faculty person to articulate a relationship between personal faith and the general problems of higher education was at least somewhat important; 65 per cent acknowledged that the ability to articulate a relationship between personal faith and a teaching discipline was somewhat important, and 89 per cent believed that the practice of a personal faith was an important factor in faculty selection. On the other hand, 85 per cent saw little importance at all in the ability of a potential faculty person to relate basic assumptions underlying the teaching field to the theological position of the denomination with which his college is affiliated.

Sixty-two per cent saw only small value in the ability of a prospective faculty member to relate basic assumptions underlying the teaching field to a personal theological position. This appears contradictory to the general viewpoint expressed by the preceding choices. The inconsistency can be accounted for by the distinction which respondents made between personal faith and personal theological position. Regarding the former as more experimental than the latter, they equated theological position with denominational dogma, thereby indicating little interest in dogma or acceptance of established theological beliefs.

Consideration of a religious balance among members of a faculty parallels the important religious factors in faculty selection. Seventy-five per cent of the deans favored basic ideological encounter as well as contrasting religious points of view within the faculty, and 72 per cent opposed a homogeneous religious viewpoint within the faculty, consistent with the previous statements.

Trustee Selection

One prominent aspect of this study concerns the relationship existing between religious considerations in faculty selection and the degree of institutional legal control. This control occurs through the selection of trustees by the church body; the more trustees the church bodies select, up to the point of balance of power, the more directly the trustees appear to affect the religious viewpoint of the college and, in turn, the faculty selection policies.

In the preliminary report on the church college by the Danforth Foundation Manning Pattillo (1965) delineates three models of church-related institutions--defenders of the faith (Group III), non-affirming (Group I), and free Christian colleges (Group II). These were later expanded to five or six, but the original three correspond to three groups of colleges reported in this paper as determined by the number of trustees selected by the denomination.

The nature of church relationship moves steadily from loose to strong in direct correlation with the number of college trustees selected by the church bodies. The church-college relationship may be described as (1) traditional and historical; (2) expressed in terms of an educational program that reflects commitments; and (3) one that sees financial support and legal control as defining the relationship. Using these categories, 20% of Group I see the relationship as traditional and historical, 50% of Group I see it in terms of an educational program that reflects commitments, and 25% see strong financial support as an evidence of church relationship. In Group II, corresponding to Pattillo's free christian colleges, no one of Group II see the relationship as traditional and historical, 50% see it in terms of an educational program that reflects commitments, and 50% see strong financial support as evidence of church relationship. In Group III, 30% of the group consider the relationship as historical and traditional, 30% consider the relationship in terms of an educational program that reflects commitments, 25% see strong financial support and legal control as defining the nature of their church relationship, and 33% include all three of these categories as significant reflections of the nature of their church relatedness. Clearly, those colleges with more than half the trustees chosen by the church body have a stronger tie than those who have fewer than 15 per cent of their trustees selected by the denomination; and the colleges in Group II fall somewhere between Groups I and III in the strength of their ties with the denomination.

Variations in religious criteria and amount of faculty participation provide the most prominent contrasts in faculty selection policies and procedures. The great differences between colleges of Group I and Group III support the thesis that more than mere coincidence accounts for the relationship between denominationally selected trustees and the importance colleges place on religion in faculty selection.

Faculty participation in the selection process magnifies the differences among the colleges of the three trustee groups. Although nearly 40 per cent of the institutions in each group follow the traditional process starting with the department chairman and moving through the dean or the president, a great percentage of Group I colleges (27%) include faculty in the procedure. Many in Group II also include faculty (23%), but only six per cent of Group III institutions allow faculty a part in appointment of fellow faculty personnel. The dean, present in the selection process 75 per cent of the time in all three groups, plays the central role while the president and department chairman participate only slightly more than half the time. Group I, with the strongest faculty participation in selection, also has the widest participation by the total administration, indicating, perhaps, a working administration-faculty procedure for selection.

The difference among types of colleges continues to be expressed in the religious criteria for faculty selection. Half of Group I institutions consider the ability to articulate a relationship between personal faith and the problems of higher education important in faculty selection and two-thirds favor the practice of a personal faith. The ability to relate assumptions underlying the teaching field to either the theological position of the denomination with which the college is affiliated or to a personal theological position is flatly rejected by nearly all Group I institutions.

Group II colleges follow the lead of Group I institutions but increase by about 10 per cent their interest in religious criteria for faculty selection. On the other hand, more than three-quarters of the schools having over 50 per cent of their trustees selected by the denomination favor, in faculty selection, the ability of a person to articulate a relationship between personal faith and the general problems of higher education as well as between personal faith and his teaching field. Only three-fourths oppose the use of a religious criterion which advocates a person's ability to relate assumptions of his discipline to the denomination's theological position and just barely half oppose this relationship between the teaching field and a personal theological position. However, while two-thirds of Group I and three-fourths of Group II believe that faculty in a church-related college should practice a personal faith, over 90 per cent of Group III institutions take this position. Thus, the more college trustees selected by the denomination the more these institutions emphasize religious criteria for faculty selection and, within these criteria, give more weight to religious observances, especially those that coincide with the denomination of the college.

Within college faculties as a whole the same viewpoint emerges. Three-fourths of all institutions encourage basic ideological encounter and contrasting points of view among the faculty when selecting personnel, but 79 per cent of Group I and 96 per cent of Group II colleges reject the desire for a homogeneous faculty viewpoint while 40 per cent of the Group III colleges support it. Again, it becomes evident that colleges with many trustees selected by the supporting denomination favor a tighter, more homogeneous faculty outlook as opposed to institutions with few trustees selected by the church body which encourage differences of opinion and religious practice.

Summary

Throughout this paper it has been strongly implied that more than a coincidental relationship exists between the balance of power on a church college's board of trustees and the practices of faculty selection. The following six conclusions summarize the findings of this study:

1. ALL PROTESTANT LIBERAL ARTS COLLEGES EVIDENCE SOME RELIGIOUS CONCERN IN SELECTING FACULTY PERSONNEL.

Every college responding to this study stated some feeling on religious criteria for selection although they ranged from casual interest to central concern. In some cases the interest was negative, a conscious attempt to keep the church from encroaching on the rights of the college, in others there was complete submission to the will of the church body, but in all cases religious criteria presented themselves, formally or informally, when faculty persons were being considered for appointment.

2. FACULTY PERSONS WHO COMBINE DESIRED EDUCATIONAL ABILITIES WITH DESIRED RELIGIOUS COMMITMENTS ARE VERY DIFFICULT TO FIND.

Part of the apparent ambivalence about using religious criteria in faculty selection hinges upon the fact that few really qualified people exist who come within the range of religious criteria in any meaningful way. Colleges often are forced to choose between educational and religious criteria and they choose the educational qualities in new faculty persons nearly every time. Since they are colleges and not churches this seems quite reasonable, but the pressure to gather a faculty that combines both educational and religious attributes or that reflects the desired religious qualities poses a constant threat to the administration of an avowedly church-related college to find such personnel. The plain fact that they do not exist in any sufficient quantity makes the business of managing a church-related college quite frustrating.

3. FEW PROTESTANT COLLEGES HAVE CAREFULLY THOUGHT-OUT RELIGIOUS CRITERIA FOR FACULTY SELECTION.

Evidence reveals that practice is either inconsistent with policy or based on no conscious policy at all. A survey of the questionnaire responses of individual colleges reveals the lack of religious criteria that reflect more than tradition or personal bias. Few institutions have harmonized their aims and religious criteria for faculty selection. Consequently, selection practices are inconsistent with policy.

4. ALL PROTESTANT COLLEGES IN ANY ONE GEOGRAPHIC AREA OF THE UNITED STATES, REGARDLESS OF DENOMINATIONAL AFFILIATION, STRONGLY REFLECT ONE VIEWPOINT ON THE IMPORTANCE OF RELIGION IN FACULTY SELECTION.

The validity of this statement can only be postulated beyond faculty selection but in this area there is a decided provincial viewpoint. This is true particularly in the South, although the north central United States forms another such province of monolithic religious viewpoint, and seems to indicate that social forces strongly affect the religious practices and standards in faculty selection.

5. A SPECTRUM OF RELIGIOUS CRITERIA FOR FACULTY SELECTION AND RETENTION EXISTS TODAY AMONG THE MAJOR PROTESTANT COLLEGES THAT RANGES FROM A LOOSE, INDIVIDUALIZED, PERSONAL CONVICTION TO TIGHT, HIGHLY CONTROLLED, ADMINISTRATIVELY JUDGED PRACTICE.

At one end of this spectrum lie the colleges which present to each prospective faculty member their religious beliefs and standards and the nature of their relationship to the church and ask the individual if he can accept them and work in that college setting, promoting the goals of the college through his teaching. No direct questions of religious belief or practice are asked in the selection interview and, if accepted, never arise again.

At the other end of the spectrum lie the institutions that ask each prospective faculty person about his religious beliefs, church membership, and related activities upon which the administration make judgments before hiring. At the time for granting tenure they make further judgment of church and chapel attendance, and other evidence of formal practice of religion but no evaluation of how well the individual communicates religious values by his personal attitudes in his teaching field or social relationships.

Some regard this latter position as a threat to academic freedom and maintain that academic freedom cannot exist in a church-related college. To others this position violates basic Christian freedoms as well.

A majority of Protestant liberal arts colleges favor individual faculty members judging their own religious convictions and deciding if they can in good conscience teach within the framework of a church college, as a particular institution perceives the nature of church relationship, rather than being judged on religious observances by the administration of the college.

6. PROTESTANT COLLEGES WITH A MAJORITY OF TRUSTEES DENOMINATIONALLY SELECTED TEND TO EXERCISE A FIRMER RELIGIOUS HOLD OVER THE INSTITUTION AND APPLY MORE RIGID RELIGIOUS STANDARDS IN FACULTY SELECTION THAN DO THOSE COLLEGES WITH FEW, IF ANY, TRUSTEES SELECTED BY THE CHURCH BODY.

This statement summarizes all the preceding conclusions. It says: (1) that any religious standard for faculty selection is more important in those institutions with many church-chosen trustees than in ones with few, and (2) that a rigid standard based on practice rather than individual agreement is projected by those same institutions.

7. A DIRECT CORRELATION EXISTS BETWEEN GEOGRAPHIC AREA AND THE NUMBER OF TRUSTEES SELECTED BY THE DENOMINATIONS WITH WHICH PROTESTANT COLLEGES ARE AFFILIATED.

The statistical correlation between geographic location and number of church-chosen trustees indicates that social and economic pressures parallel the activities or beliefs of an institution. The cultural climate of the college may have strong effect on the practices of Protestant colleges and their trustees.

In effect, trustees often find themselves influenced by regional cultural patterns, serving as a barometer of a geographic region. This "cultural climate" appears to be a prime force behind faculty selection practices in Protestant colleges as it is a prime force behind the trustees who establish faculty policy.

Several thoughts can be drawn from this evidence: (1) church control of affiliated colleges is clearly strongest in the South, (2) other studies have indicated that Southern colleges tend to be undernourished educationally; can it therefore be stated that (3) church control of colleges contributes to educational weakness rather than strength? It does, indeed, appear to be related to poor practices in selection of faculty though not necessarily caused by church control.

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THE STUDY OF FACULTY MEMBERS: SOME CAUTIONARY VERSES

Mary Corcoran
University of Minnesota

The major problems of faculty study do not lie in questions of definition and technique--troublesome though these may be--but in issues that strike at the very heart of the institutional research function:

What is our proper business? And where do faculty studies fit into this?

What is the relationship of the institutional research staff to the various power centers of a university?

How well qualified is the staff to undertake specific types of inquiry?

If my observations are correct, institutional research people feel pretty much at ease about carrying out studies of finance and of space and physical facilities, perhaps a bit wary about student studies--especially this last year or so, and very uncertain about what they should do about faculty studies. This is touchy territory, many would say, and had best be avoided. Faculty studies are "touchy," but they cannot be ignored, and certainly not by any institutional research program that is responsible for broad coverage of university programs. Flaws of planning and procedure can harm any study, but faculty studies are particularly prone to trouble if they are not clearly conceived and carefully executed. Any lack of certainty as to goal, or error in approach, will be glaringly obvious to the sharp eyes of a faculty audience.

Why do Faculty Studies Present Special Difficulties? What Are These Difficulties?

American colleges and universities operate, generally successfully, with a power tension between administrative officers and the faculty members. The latter identify themselves primarily with their particular discipline and its departmental home on the campus, although also and to varying degrees as academicians with concern for university policies through their role in such groups as the University Senate and the AAUP.

Institutional research bureaus hold varying relationships with faculty and administrative groups. The Minnesota situation with its dual ties to the University Senate through the Senate Committee on Institutional Research and to the central administrative offices through its place in the university organizational structure, is a rather unusual case. In general, it can be assumed that institutional research will be viewed by the faculty as an administrative operation. In this fact alone lies one of the basic difficulties in faculty study. To any group as knowledgeable as a college or university faculty, information will certainly be seen as a key to power, and they will surely question why it is sought and to what end it will be put.

A second cause of difficulty is the skepticism that many faculty members have about the study procedures commonly used in institutional research. This skepticism includes both a general hostility, common among humanists, to seemingly crude attempts at objective analysis of subjective matters, and some serious doubts on the part of sophisticated social scientists that institutional research people know how to ask the right questions.

A third and related factor is the special difficulty posed by any study of something close to home--in this case the faculty member himself. No one knows better than he the ambiguities and conflicts of a faculty career. No one also knows better than he how difficult it is to be objective when one is studying something that involves oneself. Questions raised by certain social scientists about the advisability of an institutional agency conducting research on the institution itself are never more pertinent than when the focus of study is on the faculty of the institution. (Sanford, 1962)

What is an Appropriate Course of Action?

No research staff can hope to resolve all the issues that underlie faculty questioning of institutional studies, but these issues should be taken into account in planning studies involving the faculty and in particular those focused on the faculty themselves. There is nothing novel about the line of action that should be followed. It has three familiar elements, (1) understanding of the institutional researcher's role, (2) understanding of the setting of institutional research, and (3) understanding of the research process. These elements apply to all forms of institutional research, but are worth a special review in the context of faculty studies.

Let us consider first the question of the institutional researcher's understanding of his role. The chief problems lie in differentiating the research function from the administrative function. In his summary address at the 1964 Institutional Research Forum, Doi (1964) identified confusion in staff and line roles as one of the chief causes for malfunction in institutional research. Institutional researchers may not often officially wear two hats, as Doi found himself doing, but they do find themselves confused as to their function as researchers and as frequently sought contributors to institutional policy-making. These confusions are particularly obstructive to good research on the faculty because of the possibilities of conflict in the researcher's various perceptions of himself--as a scientific researcher, a faculty member, and a contributor to the improvement of university policies.

The institutional researcher's conception of his role is closely related to the type of studies which he does.

At least three types of institutional studies may be distinguished, each of which assigns the institutional research office a different function:

(1) One of the most common functions is the collection of data for administrative purposes. The demands for such service can be so great as to occupy completely the institutional research staff. (Lazarsfsld and Sieber 1964)

An institutional research staff should distinguish sharply between its research and academic bookkeeping functions. Indeed its major contribution to such administrative services may rest in its ability to conduct careful studies of what information should be collected for specific purposes rather than in the continuing data collection process, once it becomes routine.

(2) A second type of institutional study--and probably the predominant research activity--is what Martin Trow (1965) refers to as "directive" research. Such research attempts to analyze current educational practice as a basis for recommending improvements. In Trow's terms such research assimilates policy-making with research.

If my observation is correct that the characteristic attitude of the institutional researcher is "action-oriented" more than detached and speculative, the typical emphasis on directive research is not surprising. It may not be the most effective course, however, as Trow points out when he says that:

> "What may be most valuable to policy makers is a fuller understanding of their own institutions and what goes on within them. This understanding may not be most adequately gained by research that restricts itself to a limited range of factors that appear to be directly involved in a specific policy decision." (1964)

(3) The type of research effort that Trow points to as potentially most productive is what he terms "illuminative" research, which aims at explaining and illuminating the nature of educational institutions and processes. Research of this type bearing on higher education appears to be now carried on largely by social scientists such as David Riesman, Burton Clark, and Theodore Newcomb and rarely if at all by institutional research staffs.

Trow points out that the distinction between "directive" and "illuminative" research is not that one is "applied" and the other "pure," but in the purpose of the investigator. If Trow is right, the man who tries to act as both a researcher and a policy maker may do policy making a lesser service than would be the case if he were to keep the two roles distinct from each other.

The second point, which is the counter-part to the first, is concerned with the perceptions that others have of the institutional research function. Obviously the function of institutional research will not be clear if the institutional researcher is not clear himself as to what he is doing and for what purpose. But even where the function was clear there is an important job to be done in seeing that others, and, in particular, faculty and administrative officers, understand these functions. Clarifying the function to oneself and to others is no one-shot job but a continuing one, because both groups change. It is one of the most neglected aspects of institutional research responsibility.

There is no better way of developing an accurate picture of institutional research work than by prompt and succinct "feed-back" to the faculty of the results of studies in which they have interest. Such statements can help a great deal in gaining faculty cooperation but only if there is general acceptance that the uses made of the studies are reasonable and in the best interest of the faculty members. No institutional research program can function successfully in the area of faculty studies if the latter seem to run counter to faculty interests. If a faculty group--i.e., a department or a senate group, sponsors a study, there is not likely to be much question on this score, but if the study is seen as still another remote bureacratic operation it is clearly in for trouble. Institutional research staffs that do not recognize this difficulty can find themselves faced with numerous modes and manners of noncooperation.

One of the not always recognized jobs of the institutional research staff is to forestall such problems by foreseeing them. While it is not likely that cooperation in filling out forms, answering questionnaires, or being interviewed will ever be completely enthusiastic, it can be reasonably good if careful attention is given to acquainting faculty members with the functions of institutional research generally and with the purpose of any specific investigation.

The third point for consideration is understanding of the research process itself. If the institutional research staff is to be able to inform the faculty, the researchers must themselves understand the purpose of the study. I noted earlier that the institutional research staff needs to understand what its relationships are generally to the university administrative and faculty structure. In addition, for any given study or program of studies, the staff needs to be clear as to its responsibilities for specifying the study purpose.

The question that is first asked of a research group is rarely the real question for which information is sought. There is no need to rehearse with this audience the many pitfalls that a supposed request for research assistance can conceal, including the familiar one that the conduct of a study, any study, is often seen as the best way to avoid the real problems to which a group has been assigned.

Faculty studies may not be any more prone to difficulties in planning than other studies, but they may be particularly troublesome when it comes to specifying the institutional research staff's role in problem clarification vis a vis the faculty and administrative groups that may be concerned. In most other study areas in which institutional research people work, their status as experts is generally recognized--only too often much too readily for their own comfort. This is not the case with faculty studies. Here every man on the planning committee may think he is an expert, and he is for his own case and for his own discipline.

There is no simple road to clarifying the problem of study in these instances, and the best solutions will vary depending on the individuals involved. The more comfortable the institutional research staff member is in his understanding of his job, the better work he is likely to do in helping to clarify the conceptions of all as to whether there is a problem to be studied, and, if so, what it is. Buried in here is a long and separate discussion as to the kind of preparation that institutional research people need, but that is another paper.

The question of preparation has relevance, however, to the next point which concerns questions of methodology and procedure. One of the hazards of institutional research work, that arises from the diversity of its coverage, is that the staff may try to do jobs for which it is ill-prepared. What is even more dangerous is that it may not recognize that a study is beyond its capacities.

Again good judgment is the key here. The researcher needs to determine whether a problem is researchable as it stands or with further simplification--identifying what can be studied reasonably well and what can be done only crudely. He needs to consider whether some parts or all of the job should be done by others. The possibility of drawing on faculty resources for specific study is frequently over-looked and the use of agencies outside the university almost totally neglected. These possibilities may have special value in faculty studies.

Two Illustrative Cases

In reaching the diagnosis that I have made as to likely causes for difficulties in faculty studies and in arriving at the recommendations for preventive medicine--in the form of clear understanding of role, purpose, and research procedure--I have drawn liberally on experiences, happy and not so happy, that we have had in faculty studies at the University of Minnesota. We have not solved all the problems. We have, however, had a good chance to learn what some of the problems are. We also probably enjoy an unusually good setting in which to work them out.

Two of our studies illustrate the problems that may arise. The first of these was the study of faculty attraction and retention that many of you may know. This was a four-part study in which we investigated the reasons why people either accepted or did not accept appointments at the University of Minnesota and also why faculty members did or did not accept offers from other universities. Considerable information was also obtained about the characteristics of persons in the four groups surveyed: those who had recently come; those who didn't come; those who stayed; and those who left.

The study may be regarded as one of the best that was done at Minnesota. For our discussion purposes today, it may be useful to analyze why it was successful. The study was successful because it satisfied fairly well the three conditions that I outlined for successful study and, in so doing, managed to minimize the objections.

First, the role of BIR in the conduct of this study was quite clear. The study was initiated by a committee of the University Senate; the Bureau was asked if it would conduct the study; the findings were to be presented to the Senate by that committee.

Excellent cooperation on the part of department heads and individual faculty members was necessary and was obtained. Several factors were helpful in receiving this cooperation. First, faculty members were generally interested in the problems under study, namely how successful the University of Minnesota is in attracting and retaining faculty; what factors do faculty members consider in making such decisions; and what might the University do to improve its position in these respects. Second, the study was sponsored by the highly respected Senate Committee on Education, which appointed an excellent, hard-working subcommittee to take general responsibility for the study plans. Third, the Bureau was fortunate in the calibre of staff it had available for contacts with faculty and administrative groups and for planning and conducting the study.

In addition to the clear role of the Bureau staff as working partners with the subcommittee, the basic goals of the study were carefully delineated. Problems of definition--such as what is an offer--were faced squarely and workable decisions made as to what this meant for the study purpose. The plans for data collection and analysis drew upon the combined talents of the staff and subcommittee members who had special strengths in economics, psychology, and survey procedures, all of which contributed to the development of study procedures. They also contributed to the reporting of the study findings which was done in two ways:

(1) The subcommittee (Sub-Committee on Attraction and Retention of Faculty 1960) drafted a report that was approved by the Senate Committee on Education and presented to the University Senate. This relatively brief report outlined the present status of the University with respect to faculty attraction and retention and presented a set of recommendations as to how it might be improved. These recommendations have been clearly reflected in subsequent actions of the University administration with respect to faculty fringe benefits, parking, and housing, to cite three examples. They also led to the Senate's establishment of a standing Committee on Faculty Welfare.

(2) The second report was a longer, more detailed publication which was prepared by the Bureau staff for distribution to the members of the Senate and to anyone else interested in full details of the study conduct and findings. Many of you may know of this report since it is one of the BIR report series. (Stecklein and Lathrop 1960)

The possibility of widespread general reporting of a study such as this one was also a satisfaction. Institutional research workers, like other researchers, need the stimulus that comes from the opportunity to publish their work and have it examined by their professional colleagues. The habits and character of institutional research work have typically prevented such publication. In our view this is unfortunate from a professional standpoint.

It is easy to accept the argument that certain information should not be available outside the institution. The study used as an illustration is a case where such an argument was not used. It might have been. Perhaps it might have been if the results had turned out differently. This is hard to say.

Faculty studies are not the place where institutions unaccustomed to publishing reports are likely to begin, but I would point to the considerable growth in openness to reporting information on student studies in recent years for leads as to how faculty studies might also be improved through cooperative and eventually more open research.

The faculty attraction and retention study thus represents a case in which the purpose of the study was clear, acceptable, and researchable. The planning and study procedures were sound theoretically and technically. The role of the institutional research staff was well understood and it was able to work at a high level of research responsibility.

A second study that was less satisfactory from a staff point of view will illustrate what can happen when clear understanding of study purpose is absent and the procedures used are inadequate for the task.

This study was also initiated by a Senate Committee as a consequence of a rather general concern about the effect of tightened market conditions on the calibre of new faculty members. The aim appeared to be to obtain some assessment of the quality of the persons who joined the faculty in recent years in comparison with those added earlier. The problems of evaluating faculty quality and of deciding who and what could be evaluated were many. The resultant study design, although technically not a bad one, never did really satisfy the committee. When the completed study did not yield the results expected by some committee members, they seemed to lose enthusiasm for the entire project.

Looking back over the history of this project, I can find evidence that it missed on all of the points outlined as guidelines:

1. The Bureau staff found itself caught in a situation in which it was not clear why the committee wanted to do the study and what they would do with the findings when they had them.

2. The planning of the study now appears to have missed the main point. The problem that concerned the committee was only partly associated with new faculty additions. It was probably a much broader concern about the effects of many changes in faculty character--in part because of new additions, but also for other reasons including the heightened mobility of senior faculty members.

3. Like most post hoc studies, the information available for study was less than ideal. This was particularly so with respect to the evaluative information basic to the study purpose.

In a curious way, the fact that the study findings did not indicate any change in the quality of the new faculty members--insofar as quality could be measured by the means used--also contributed to the demise of the study. If the findings had indicated a marked decline in faculty quality, I think that the committee would have wished to see the study completed. As it was, the committee foresaw no dramatic policy statement and hence abandoned the project.

In concluding, let me say that in conducting faculty studies there is no straight and easy road but many unexpected twists and turns. There are peaks of satisfaction and pits of annoyance. Despite these problems, no group so vital to a college or university as its faculty can be ignored in any comprehensive institutional research program. No field of study has more potential value or more intrinsic interest. Sound planning for faculty research can teach us much about how to improve institutional studies of all types. The problems--of role, purpose, and research competence--are the same, only more so, when we study the faculty.

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NOTES ON FACULTY INPUT

Kenneth G. Nelson
U. S. Office of Education

The condition, size, and characteristics of the teaching faculty have been studied with a variety of approaches. David G. Brown, (1965) in his The Market for College Teachers studied how 103 faculty members at 18 of the largest southeastern schools had been recruited to new jobs and conducted interviews with them and 50 department chairmen seeking answers to a series of questions relating to how faculty seek new employment, and how they are attracted to, and accept, new jobs.

Dr. Brown has since expanded upon this preliminary study with a study of approximately 7,500 new faculty members which will be reported in three additional studies: (1) A 600-page study of "Academic Labor Markets," (2) a 200-page study of the 20 best efforts to place college teachers, entitled "Placement Services for College Teachers" (such as the bureaus at the Universities of Illinois and Michigan, the American College Bureau, the Cooperative College Registry, etc.), and (3) a brief study of "The Mobility of Academic Scientists." All of these will appear in published form in the near future.

Another much-quoted study has been the series on Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, by Ray Maul of the National Education Association (NEA) Research Division, in which national data on new faculty are collected in biennial studies, with the study for 1963-64 and 1964-65 being the sixth in the series.

U.S.O.E. Study

In the U. S. Office of Education, we have gathered data on a 10 percent sample of faculty who taught at least one class, held the rank of instructor or above, and were employed full time by a university or 4-year college in the spring of 1963. (Comprehensive report now at printers and will be available in a few months.) The sample of faculty was examined in many segmented groups, and with respect to a number of characteristics, the total of which cannot be discussed here. It was possible to divide the faculty study into three groups or parts: (1) Those who were new to higher education in the year surveyed, (2) those who had previously been in higher education, but had been at a different institution in the previous year, and (3) those who had been at this same institution the previous year.

The division of faculty appeared to be a fruitful line of inquiry because one out of every ten members of the teaching faculty in 1962-63 was new to higher education. The ten percent level for faculty input is needed to replace an estimated five or six percent departure of faculty from higher education as well as to provide faculty for an annual eight to ten percent increase in the number of students. Once assured that, in sheer numbers, the input to the faculty group seems adequate to its growing task, an important and legitimate area of concern is the characteristics and quality of this input; recognizing, of course, that with respect to quality, we may only draw limited inferences from cross-sectional data such as this. Some of the differences in these groups are, in many instances, interesting and worthy of some discussion.

New Faculty Rank

As we might expect, the new faculty were of markedly lower rank than those who had previously been in higher education. Seventy-nine percent were in the ranks of instructor or assistant professor, while only 41 percent of those who had previously been in higher education were in those lower ranks. At the other end of the spectrum, only 7 percent of the new faculty were professors, while 30 percent of those previously in higher education held this top rank. It was found that 74 percent of the new faculty were less than 40 years of age while 51 percent of the transfers and 35 percent of those who remained were below their age.

The appearance of a higher percentage of the new faculty at the lower ranks correlates with the finding that 44 percent of these new faculty members had been a student immediately prior to accepting this first faculty appointment. Of the faculty who had come to this institution from some other institution of higher education the previous year, only 30 percent had been students, and of the faculty who had not made any shift, only 26 percent had been students prior to this appointment.

Complementary to the data on previous student status were the findings on previous professional experience. The most common type of previous professional experience for all groups was employment as a part-time teaching assistant. Faculty transferring from some other institution were more often found to have had part-time experience as a part-time research worker (49 percent) than those who were new in higher education or those who remain (18 to 29 percent).

A rather simple, but most important, comparison of these groups may be made in the area of educational attainment. It is not surprising to find that the faculty who transferred from another institution had the highest percentage of doctorates--72 percent. Those who had not moved from one institution to another had a much lower percentage, 49 percent. It is quite apparent that attainment of the doctorate is an aid in mobility, or, that the person who attains a doctorate is also the kind of person who seeks, or is sought by, new positions. Among the new faculty, only 34 percent had the doctorate. It is likely that many new faculty do obtain the doctorate after accepting faculty appointments since 19 percent have completed "all but dissertation" and another 13 percent have a master plus 30 hours.

Primary Assignments

One of the outstanding differences among these faculty groups which emerged from the survey is that of primary assignments. For instance, the new faculty are primarily assigned to teach (94 percent) and that teaching is mainly on the lower division level (53 percent). Those faculty members who had recently transferred from another institution may well have been lured by promises of small teaching loads since only 76 percent of them listed teaching as their primary assignments, and only 27 percent of those taught in the lower division. Of course, we cannot draw any firm conclusions here, since the difference is surely at least partly attributable to the seniority differences between these two groups. However, those faculty members who remained at the same institution also showed a greater involvement in teaching, with 91 percent of their number giving teaching as their primary assignment, and 42 percent of them teaching in the lower division. Looking at this phenomena from the graduate point of view, the new faculty have little involvement with graduate students, with only 13 percent of them teaching on that level. Among the faculty who had not transferred, the percentage is not much different, with a reported 16 percent teaching graduates. However, when we look at the transferring faculty, we see that 39 percent of them are involved in the teaching of graduate students. Clearly, when a number of these data are combined, we begin to get a picture of a very different kind of faculty member in the transferring group.

The above comparisons seem to indicate that new additions to the faculty group are not identical, in terms of their characteristics, with the group of faculty members that they are joining, or the group of departing faculty members they replace. These comparisons also suggest that the portion of the total faculty that is represented by the new additions to the group is in part molded and modified by the total group into something approximating the group's own ideal group image. This hypothesis needs to be tested.

Those faculty who depart from the group likely have as much influence on the total constituency of the group as do the new arrivals, since their characteristics vary from that of the total group and by their departure they remove their influence from the total of the group characteristics.

In fact, in closing I might report that a study of these departing faculty is already under way. While the subject has only indirect bearing on faculty input, it may be interesting to note that

90 percent of all faculty planned to remain at their present institution for the following fall; 5 percent planned to remain in higher education but not at their present institution, and the other 5 percent planned to leave higher education. The firmness of these intentions is being tested by a study of those faculty members who expressed no such intention. While the study is not yet complete, we have learned that of those who planned to leave their present institution, 66 percent carried out that intention by the fall of 1963, and either went to another institution or left higher education entirely. Of those who had expressed no intention of leaving either their institution, or higher education, 7.2 percent left their institutions in the fall of 1963, either for another institution or left the field of higher education. Over all, 13 percent of the total faculty left their institutions in that year compared to the 10 percent who had planned to do so. Of this 10 percent who planned to leave it was found that more of those not holding the doctorate did in fact leave by the following fall (71 percent) as compared to those without the doctorate (59 percent). This may indicate that institutions made substantial efforts to retain the doctorate group who were making plans to leave.

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THE DIMENSIONS OF PROFESSORIAL COMPETENCE AND THEIR MEASUREMENT

Gerald H. Whitlock
The University of Tennessee

The problem of evaluating teaching effectiveness is even more complicated than that of evaluating research competence because professorial competence include research competence. But it is more than that. It consists also of the ability to stimulate or arrange for the stimulation of students in such a way that they respond by acquiring the knowledge and attitudes which in aggregate represent the objectives of "higher education." And beyond that, a really good college teacher is expected to participate effectively in maintaining a proper academic atmosphere--one which ensures that standards of excellence prevail within his institution.

Thus we can readily identify three logically independent dimensions of professorial competence: (1) professional competence in the subject matter, (2) effectiveness vis-a-vis student learning, and (3) institutional service. So, whenever we use the term professorial competence, we are referring to some weighted combination of assessments on these three performance dimensions. I should like to relate some of our attempts at the University of Tennessee to develop scales for measuring performance on each of these dimensions, and to determine how these measures should be combined to arrive at an overall measure of effectiveness.

1. Professional competence: The traditional measure of professional competence has been some function of the number of publications. We discovered that in addition to this there was available for our Liberal Arts faculty at The University of Tennessee an annual listing of: number of active research projects directed; number of professional society memberships; number of professional meetings attended; number of professional addresses given; and number of theses and dissertations directed. Three questions were explored in connection with these data. (The details are presented in a Master's thesis by H. V. Worthington, III, Department of Industrial Management, University of Tennessee, 1965.) The first question was whether or not these data possessed sufficient reliability or reproduceability to be used as a measure of anything. In general the reliability coefficients were surprisingly high, the mean coefficient being .73. Hence, these measures possessed the fundamental properties required of any criterion measure: reliability and relevance.

The second question was whether or not it made sense to consider these six variables as measures of the same thing. In other words, is this set of variables unidimensional or multidimensional? In order to determine this, Worthington computed the intercorrelations between the six measures and then performed a factor analysis on the intercorrelation matrices. (Two factor analyses were performed, one for faculty in the natural sciences and one for those in the social sciences and humanities.) It was found that a Spearman General Factor Solution satisfied both matrices. This meant that the total variance among the six measures could be explained by a single factor of dimension. Thus, it could be concluded that all six measures of competence measured essentially the same thing; in other words, they were found to be unidimensional.

The third question was what weights to apply to the various measures of professorial competence. Based on the factor loadings, it was observed that for the natural sciences one could simply apply a weight of one to the values for each of the variables, i.e., simply add them up. For the social sciences and humanities a suitable weighting system was to give a weight of three to the number of publications and number of theses directed, and a weight of two to the remaining.

2. Effectiveness as a teacher: The traditional measure for this dimension has been some form of graphic rating scale usually completed by students. We are all familiar with the weaknesses of such scales. All such scales really measure only the response of the rater to the set of his observations which occasioned or provided the stimuli for such a response. Based on some of our previous research at The University of Tennessee, we know that it is possible to

collect from the students themselves the "performance specimens" which, when observed by the student on the part of the teacher, are the occasions for making judgmental responses in regard to the quality of performance. We know also that the student's overall rating of the teacher's performance is a power function of the number of such judgmental responses. Knowing, then, the stimuli for the overall ratings and the relationship between the stimuli (or the observations of performance) and the response (or the evaluation of performance), it was possible for us to use these stimuli--or performance specimens--as the rating instrument. We thereby obviated the difficulties inherent in the traditional rating procedures. Briefly, the procedure is this: a large sample of students are interviewed and asked two questions: (a) Think of a time you saw one of your professors do something in class such that when he did it you said to yourself, there is an example of uncommonly good teaching; what did he do? and (b) Think of a time you saw a professor do something in class such that when he did it you said to yourself, there is an example of uncommonly poor teaching; what did he do? Continue to sample students until the odds are twenty to one that the next student will not give you a new performance specimen. Edit, collate, and present the specimens in the form of a check list. There probably will be about fifty specimens. Present the check list to the students of the professor being rated and simply tell them to check the things they saw the professor do in class. Where specimens of both effective (E) and ineffective (I) performance are checked, the score is the ratio, E/I. Otherwise, it is the number of specimens checked. This score has high reliability, is less subject to bias, is highly relevant, and produces good spread among ratings.

3. Like death and taxes, committee assignments befall most college professors. Some are extremely important, such as the committee on graduate studies, while others are trivial. What one needs is a way to scale these committee assignments in terms of their importance to the university. For this, I recommend an approach used in industry to evaluate jobs. Select a representative set of committees ranging from the most trivial to the most important. Describe these committees carefully with respect to both importance and scope. Get a sample of knowledgeable deans and top administrators to scale the committees by assigning 100 points to the committee worth most from the university standpoint, and points to the others in relation to this. Then for evaluating any particular professor's committee assignments, simply slot them into the master scale and assign corresponding points.

So we have three separate measures, now, for each professor: a measure on professorial competence, a measure of effectiveness vis-a-vis students, and a measure of his contribution to university policy making. The next question is how do you combine these into a single measure?

As is always the case when considering the weights of criterion dimensions, the problem ultimately reduces to the judgment of experts. In the present case the experts might consist of department heads of those departments offering courses which range from freshmen to doctoral. In a study one of our students is completing, we asked such a group to weight the above three dimensions separately for teachers of lower division courses (freshmen and sophomores), upper division courses (juniors and seniors), and graduate courses. The scaling is simple. Just have each department head divide 100 points among the three dimensions in such a way as to reflect their relative importance. Then compute the mean values. The results are not in yet, but I hazard the guess that we will find that for lower division courses the most important performance dimension will be effectiveness with students and that the importance of that dimension will diminish as course level increases; and that the weight of the professional competence dimension will increase as the course level increases.

The final overall rating of teaching effectiveness is the sum of the three dimension scores, each multiplied by its weight.

In the brief time I have, it has not been possible to discuss the many problems associated with each of the dimensional scores (for example, a factor analysis has revealed six dimensions of the student ratings alone). What I have presented represents my conclusions at present as to the best way of accomplishing the task of overall teacher ratings. We are aware of the problems and hope that some of the research we are doing will result in some improvements.

IMPLICATIONS FOR INSTITUTIONAL RESEARCH IN THE PLANNING OF INTRA-UNIVERSITY FACILITIES

-or-

(Facilities Action Implies Research)

William Fuller
University of the State of New York

Stephen Leacock once said "If I were founding a university I would found first a smoking room; then when I had a little more money in hand I would found a dormitory; then after that, or more probably with it, a decent reading room and a library. After that, if I still had more money that I couldn't use, I would hire a professor and get some text books."

This quotation emphasizes the importance of facilities as a part of the total university and college planning. However, before we start to talk about the implications of institutional research in long-range planning for intra-university facilities there are two definitions which we must have before us.

First, what is institutional research? To me, institutional research is the search for intimate knowledge of all elements which make up an institution of higher education - students, faculty, curriculum, facilities, and finances - which may then be used to assist the administration in making decisions that affect the institution. (Data provided do not make decisions but only assist in the making of decisions.)

Intra-university facilities refer to the buildings which make up the campus of one university, whether it is a small institution with several schools or colleges located within a few steps of each other or a large multi-campus such as the State University of New York, which spreads across an entire state. Long-range planning for facilities does not depend upon inter-university relationships, whether or not an institution is a college or university, whether it has 500 students or 50,000 students or whether it is simple or complex. For every institution, regardless of size, kind, or type, appropriate long-range planning deals with the same five elements: finances, curriculum, students, faculty, and physical plant.

Let me quote a short statement from the New York State Plan for the Higher Education Facilities Act for 1963: "The evidence of a long-range plan (at least five years) for institutional development which describes the function in need of the proposed project (is required). The scope of such a plan may be compiled and reported in a single document or a series of interrelated documents but points will be assigned in relation to the inclusion of the following factors: (1) The future educational purposes in the academic program of the institution and the effect such purposes and programs will have upon the existing policies: (2) A formal study of enrollment projections for the institution in its major subdivisions stating the assumptions which underline the projections; (3) A projection of the institutional budget showing planned expenditures and sources of income; (4) A study of the proposed faculty and staff needs with a planned program of recruitment; and (5) A comprehensive master plan for physical facilities."

You will note that the reference to physical facilities comes last. However, in planning for higher education facilities needs, the usual relationship will possibly put the five points in a different order, with the financial factor first; because, once you know what funds you have, then you know the limitations of size you have in building the facility. When you know the size of the facility, you know how many faculty you can put in it. Once you know the number of faculty the building can accommodate you know how much room is left for students, and, finally, you hope that you can adjust your curriculum to this building which you have now planned. However, I maintain that the order should be slightly different if further reasons are applicable.

Curriculum Inputs

The first item that one must look at when considering the addition of new facilities is the curriculum. What new departments are created? What new courses are going to be added?

What methods of teaching are being used or are proposed? What are the trends or the desires of faculty for class sizes using the teaching methods which are being proposed? What are the past practices in the curriculum area? Is the curriculum one of lecture and listen? Is it one of student participation? Is it heavy on seminars? Is it a laboratory-oriented curriculum rather than a classroom-oriented curriculum? What audio-visual devices are required? What audio-visual devices are projected? What use is made of these devices? Is the student self-directed or instructor-directed?

The above questions must be asked along with many more. The faculty and administration must be challenged in their thinking not only as to what they are doing now and what has happened in the past, but with respect to the future. Where are they going, what are they doing to make Johnny a better student? When we were developing the criteria for the State Plan for Title VI of the Higher Education Act of 1965, Improvement of Undergraduate Instruction, we were faced with a very serious question. The Federal Government had asked each institution to list the deficiencies in its academic curriculum which it hoped to correct through the use of new equipment. Our group suggested that it would be more appropriate if we asked institutions and faculties to provide us with statements of how they planned enrichment of existing curriculum through the use of equipment.

The Federal Office has assumed that by providing equipment to colleges and universities curriculum will automatically be improved. After receiving 121 applications for Title VI from approximately 100 different campuses, these applications having required considerable work from both faculty and administration, I am not sure that we can make the assumption. In fact, I am not sure that faculty know (or admit) deficiencies or recognize enrichment. Time after time we read in the application "I need this equipment to help me." The faculty member expresses no knowledge of why he needs the equipment or how this equipment will help him in his teaching or eventually provide better students.

How can we provide good instructional facilities for colleges and universities if the faculty cannot tell us what tools they need, why these tools are needed, and how they are going to use the tools, whether the tools be a chalkboard, or an extremely complicated piece of scientific equipment? We must get better answers before we can get better buildings. We must get a more intimate knowledge of curriculum.

Student Inputs

The second input must be students. If we know what the curriculum is, what the curriculum will be, what changes are going to be made in curriculum, then we can start to determine what students are going to be attracted by this curriculum and by this institution.

To plan facilities we must know a tremendous amount about students. In most cases, we have found out that enrollment projections (in New York State) consist of a statement from the President indicating that in 1970, 1975, or some year in between, they will have so many students (always in good round numbers). When this statement has been made by the President, someone on the faculty or administration has them scrambled to see if there are any possible statistics which might be developed which would come up with this magic figure. The institutional researcher, to plan facilities, must know what type of student mix he has. What is the class level? Can the class level be determined? How many students in a curriculum or a course? Is the student a part-time student or a full-time student? Is he a resident student? Does he live on the campus or is he housed off the campus? What credit hours has he taken? How many clock hours? What is the average load of a student?

I have listened to many registrars or deans of students these past two years who have cheerfully assumed that since 15 or 16 or 17 credit hours is required each semester or term for a student to graduate that this was the average student load of the complete institution or the normal student load. Very few have ever delved into the figures to find out what the figure really is. How can we make assumptions for enrollment projections without adequate knowledge of the experience over the past year or ten years?

I maintain that in making enrollment projections for facilities the most important item is the number of student contact hours, that is, the number of hours each week that the student is in contact with an instructor in an academic facility. The contact hours in classrooms, in laboratories, (including physical education), the contact hours in individual study areas such as music studios or art studios, the contact hours, if you will, in the library, (that is a figure which nobody knows), are most necessary to predict space needs. These figures will give us the information which we need to plan these facilities because we can then take a curriculum and relate it to the student. The curriculum requires certain things of the student and the student requires certain things of the curriculum and these can be best expressed in contact hours. We then know that contact hours can be related to space and facilities needs.

Faculty Inputs

If we know what the curriculum will be and if we know what students we will have (in terms of head count, full-time equivalent, and student contact hours), then we have some hopes of knowing what the faculty needs will be.

But, what is a faculty member? Is he a head count? Is he a full-time equivalent? Is he a researcher or is he a teacher? Does he have administrative responsibilities? Does he have outside institutional responsibilities? What is his course load? How many courses does he teach? How many students does he have in these courses? To improve teaching, how many students does he wish he had in these courses? How many students should he have in his class? What type of space or facility does he need for his own work? All of these questions must be asked to determine the relationship of faculty to the new facility.

As indicated in one of the above paragraphs the most difficult job that an institutional researcher has (or a facilities planner has) in relating to the faculty is to get the faculty members to talk in terms of functional needs rather than desires. The example of the faculty member who is planning a new laboratory and who states his desires for a certain table is an old one. When you ask him why that particular table, he will tell you that he has used it for 25 years and has found it to be the most sturdy and the most solid and best "lab" table that he has ever had. On the other hand, if you attempt to question him in terms of functional uses to determine the size of a student station, you will find that he has very seldom thought of what his actual needs are. For example, if a microscope is to be used in this course, how often is that microscope used? Should the microscope be stored at the student station? Should that microscope be immediately accessible to the student? Should it be stored within the room? Can it be put in a separate room? Must the separate room be on that floor or can it be on another floor? What are the storage needs of the student? What limits the size of the student station? Can two students work together or must one student work by himself? What is the largest piece of equipment that the student will use? All of these questions and many others must be asked of faculty to assist them in determining their needs as they relate to students and curriculum. The faculty inputs then take two configurations, the number required and the space which they need.

Facilities Inputs

How can an institution plan facilities without knowing what exists? How is space being used? How is space allocated? Who has the responsibility for assigning space? How is space utilized? We all say we have a space utilization study and that we know a room is being used so many hours per week. But have you noticed that we are very careful about which rooms we select to be included in that utilization study so that our pattern of utilization looks very good when compared to the so-called "nationwide standards." I maintain that there is only one way of comparing space utilization figures. That is, are you doing a better job this year than last year? Are you improving the use of space?

I also maintain that there are three measurements of the use of classroom and laboratory space which may be expressed in one space factor. That is, the size of the student station, the use of the student station, and the use of the room which combine in the square foot per student contact hour.

What relationship does class size have to room size? Do you build your rooms so that each professor will have two stations per student so that he can alternate students when he gives a "pop" quiz? Do you actually know what your class sizes are? Do you know whether these classes have changed from year to year or do you accept the faculty statement that class sizes are increasing every year, when in fact they may not? What is the effect of your daily schedule, weekly schedule, yearly schedule upon the use of facilities? What proportion of the total facilities do you have in classrooms? Is the proportion three percent or is it fifty per cent? Do you need more instructional facilities or do you want more related or service facilities? How does one department compare with another department? Does the chemistry professor get an office, a special research area of his own, and an instructional laboratory which only he uses? Does his peer in the mathematics department get only a small office and share a classroom with everyone else? What are the inter-relationships between space related to instruction and space used for research purposes?

The institutional researcher must study the utilization of all space to be able to develop the inputs necessary to predict facilities needs.

Financial Inputs

Once we have determined what the curriculum will be, the number of students that it will attract, the number of faculty that are required, and the size of a facility to meet all of the above needs, then we can determine what the cost of such a facility will be.

What should the institutional researcher know about the cost of a facility? Is it his responsibility to project costs of facilities? Is it his responsibility to know what bond markets are? Is it his responsibility to take the place of the architect in this function? No. Unless an institutional researcher has an interest and knowledge of finances, this item is best left to the experts and to the administration. They can determine cost trends of past construction; the values of obtaining a Federal Grant, a Federal loan, a private loan; the use of such holding corporations as the New York State Dormitory Authority; or the use of private funds or cash to finance facilities. But the institutional researcher should have some involvement in studies within the institution as to the amount of funds from existing sources which throughout the years may become available for capital outlay. He may also be involved in making various financial analyses regarding the availability of funds which may be used to subsidize facilities.

Conclusion

In retrospect, this paper is not a "how to" presentation, it is a "what to" presentation. If it were the former, a very long paper would have been needed, then we would have disagreed, gone our separate ways, and developed our own "how to" methods. This is what we, as institutional researchers, should do. What works for me, may not work for you. And, what works for you, may not work for me. But if we can get together and share our mutual experiences, perhaps both of us can benefit.

AN INVERSE RELATIONSHIP: THE USES OF FACILITIES PLANNING FOR INSTITUTIONAL RESEARCH

Thomas R. Mason
University of Rochester

Well-worn proverbs describe the relationship between institutional research and the planning of physical facilities:

Proverb No. 1. "Form should follow function."
Proverb No. 2. "Educational planning should precede physical planning."
Proverb No. 3. "Educational facilities must be flexible."

In other words, we are unable to predict or plan with any certainty the durable functions of colleges and universities. Therefore, we want elastic buildings that are also soundproof and inexpensive.

Winston Churchill gave us another proverb in his observation on the historical impact of the houses of Parliament -- "We shape our buildings... then they shape us." Here we have the dilemma: form follows function; function changes; form, in brick and mortar, persists. And we are all aware of the multitude of ways, overt and subtle, in which we adapt our behavior to the building spaces that we inherit. We also are aware of how adaptable some of our ancient structures are to our changing needs.

All these proverbial propositions add up to a recognition that the institution's system of facilities forms a matrix that contains and constrains (more or less loosely) the complex processes of interaction and communication composing the functions of colleges and universities.

The plea for flexibility suggests the extent to which we chafe against the walls of our buildings and the high cost of moving them. We confess our uncertainty and the unpredictability of the directions of program development and methods. We conscientiously try to avoid imposing our own misjudgments of the future on the next generation. We seek a pragmatic open-endedness that will permit responsiveness to change and innovation.

Yet there are acute and painful limits to flexibility. Building structures and mechanical systems must obey building codes and physical laws, (and fiscal laws, as well). Multi-purpose space often reaches the point of being purposeless. Certain kinds of flexibility become nothingness. At some point, we are forced to make commitments, and we cast these commitments into steel and concrete.

Paradoxically, the better we define our purposes and describe functions, the greater the danger of overdesign of facilities for specialized and transient functions. The paradox is resolved, however, when we recognize that the more thoroughly we understand institutional functions, the more clearly we understand the dynamics of change, the more effectively we can design for adaptability.

Program Budgeting

Under the auspices of the Educational Facilities Laboratories, a great deal of work has been done in recent years on the problems of form and function. This work is summarized in the chapter by Horn, King, and Morisseau on "Facilities and Learning" in Sam Baskin's recent compendium on higher education (1965). The authors identify four vital issues of research and development work on college and university facilities: changing technology, the need for flexibility, the utilization of space, and the socio-physchological aspects of education. The Educational Facilities Laboratories (EFL) projects in general have done a superb job of demonstrating good design solutions for particular kinds of facilities problems. However EFL, by choice no doubt, has not paid much attention to the programming aspect of facilities planning.

This paper will discuss the processes of planning, programming, and design of physical facilities as an integral part of planning, programming, and decision-making processes for overall institutional operations. Recently David Novick gave us a definition of planning and programming:

> Planning is the production of the range of meaningful potentials for selection of courses of action through a systematic consideration of alternatives. Programming is the more specific determination of the manpower, materiel, and facilities necessary for accomplishing a program. In addition. . .programming entails interest in the dollar requirements for meeting the manpower, materiel, and facility needs. (1966)

This quotation is taken from the new "Bible" of the "Federal Establishment," the RAND Corporation study, Program Budgeting: Program Analysis and the Federal Government.

The Program Budgeting approach is going to have a tremendous impact on institutions of higher education, especially on institutional research, planning, and budgeting operations which will be responsible for meeting the impact. The movement, in particular, will stimulate the development of a parallel approach in higher education and will compel the development of greater uniformity of concept, definition, and method in higher education research and planning.

The agencies dealing with higher education are currently searching for input-output models to use in the projection and evaluation of federal programs. Conceptually, these models evolve around the input of federal dollars into higher education programs and facilities and the output of educated manpower and research called for in pursuit of the national interest. Theoretically, the institutions of higher education collectively constitute the "black box" of the system, both the receptacle into which resources (funds) are poured and the unknown quantity, so far as the results that will be produced are concerned. The institutions are the instrument of federal programs, in this approach, and they introduce too much drag between input and output to be treated as predictable processors. The agencies are going to seek a great deal more factual and available information for allocation of resources and evaluation of results from their client-institutions. They also will expect more and more effective planning, programming, and performance in the use of federal funds.

Since a major portion of federal support for higher education still is for facilities--buildings and equipment--physical planning and programming will come in for special attention in the implementation of Program Budgeting in National Science Foundation, National Institute of Mental Health and United States Department of Health, Education and Welfare. However, a critical aspect of the Program Budgeting approach is that men, materiel, and facilities, capital funding and operating expenditures, are integrated into a unified system of projection and evaluation. Another important facet is the insistence of its prophets upon long-range--or at least medium-range--projection of consequences and costs. Since a long-range orientation is essential for effective physical facilities planning, the brick-and-mortar game may have a special role and utility in the development of an on-going comprehensive planning, programming, budgeting system in colleges and universities.

Upon close examination of the Program Budgeting approach, we may discover, as did Monsieur Jourdain, that we have been talking prose for twenty years. Program Budgeting contains many of the elements described by Rourke and Brooks (1964) as part of the "Managerial Revolution" in higher education. It involves applications of the methods of analysis and evaluation -- operations research, decision theory, systems analysis, and cost-benefit evaluation -- that have been increasingly part of the vocabulary of institutional research, budgeting, and planning in higher education. It is a fruition of a long trend of conceptual and methodological developments in administrative decision making and policy formation, greatly stimulated, of course, by war, computer technology, and superorganization.

The promulgation of Program Budgeting as the administrative style of the Great Society, the publication of its testament by RAND, and the resulting formation and spread of program budgeting attitudes and methods will stimulate the further development of comprehensive research and planning systems in higher education.

I should like to suggest that the process of physical planning provides an effective medium for building a comprehensive and systematic research and planning process for long-range institutional operations.

First, since long-term decisions and high cost commitments are involved, facilities planning commands more serious concern from faculty and administrators about the future beyond next year's faculty recruiting, beyond next year's operating budget, and beyond next year's schedule of courses. The orientation to the future in facilities planning calls for prediction, which in turn is conducive to more rigorous research into the dynamics of institutional behavior.

Second, the spatial system of the institution interlocks with almost every facet of institutional operations. The planning, programming, design, financing, assignment, utilization, and maintenance of space--if done systematically--requires information about every operation, activity, and load functioning or expected to function in the institution and its immediate environment. And every kind of research specialty--psychological, behavioral, educational, financial, organizational, and physical--can and should be brought to bear upon the facilities planning process. It can therefore serve as an organizing structure for more comprehensive, systematic, long-range planning and programming of faculty, staff, and other resources required to effectuate the institution's proposed program development goals.

Finally, the planning for expansion, renovation, and reorganization of physical facilities creates an opportunity for innovation and revision of curriculum, instructional methods, and institutional organization. All too often, this opportunity is lost due to our perpetual haste to get buildings built. It is also frequently lost because of the organizational isolation of facilities planning in physical plant departments or state agencies. This separation of facilities design and planning is one of the most serious errors of university and college organization, because the decisions made in this process have innumerable operating consequences too often overlooked. Research, planning, allocation, and decision processes should function as an integrated part of the programming, cost evaluation, and design sequence. The architect and the physical planner have a critical role in uncovering, evaluating, and resolving literally thousands of significant operating decisions: how faculty members work; how students study; and how the two communicate. What will the electrical load of the building be in 10 years? How should service traffic be handled? How should chemicals be stored and disposed? Relatively few of these kinds of questions can be programmed in advance of design, yet they invoke decisions that should be fed back into the overall planning system, operations programming, and operating budget projections, as relevant.

While facilities planning has characteristics that make it a natural focal point for long-range comprehensive planning, we do not want to overstate its significance or to imply that it commands any priority of determination. For one thing facilities planning is an irregular process in smaller, more stable institutions. When construction or remodeling occurs, it is in response to desired program growth and change, and facilities planning is useful as a probe for making critical decisions. But it is still merely one element among the resources related to overall program structure and loads.

To illustrate the interrelationships of space to operations, Figure A represents the most commonly used model of operating relationships in American colleges and universities. This is the core segment of higher education functions, the formal, organized instructional program. Most other operations are parametrically related to this core set. Research, library, public service, and student activities, housing, and auxiliary enterprises can be tied to factors representing faculty, student, and program loads and characteristics identified in the instructional program segment.

The instructional program model is composed of the elementary relationships that have been used for years by institutional research offices to produce analytic studies of class sizes, faculty teaching loads, unit cost comparisons, and space utilization studies. The raw data are available in every registrar's office waiting to be extracted and used by the systems man for a total information system, converted to parameters by the operations research man, simulated by the computer for a million combinations of variables, decisioned by the decisionmakers, planned by the planners, programmed by the programmers, and used by users.

This basic model, extended by chains of relationships to other operations, can serve as the central conceptual structure of an integrated institutional research and planning system. Of course a great deal of work must be done to build an operating system of program analysis, planning, and budgeting around such a structure. It is in fact being done by many institutions, and many people are working on computer simulation models based on this kind of scheme. As a central conceptual scheme, the instructional program model has the virtue of being segmental and incremental--it can be built a piece at a time and added to as new knowledge develops. It is hoped that with refinements and elaboration such a conceptual scheme can serve to integrate the rather dispersed and fragmented results of many kinds of institutional research into a coherent and increasingly comparable body of knowledge about higher education.

For example, student enrollment, retention, and progression research can be related to the system from which population inputs are planned. The relationships between degree program structures, curriculum, student choices of program and courses, and variations in student characteristics link to course registration patterns. The content and methods of the instructional program generate continuing sequence of research, much of which is lost for lack of a conceptual system to give it order and meaning beyond a particular problem in a particular institution. The consequences of program changes, changes in teaching methods, and changes in student mix by level have a significant effect on class size structure and time demands that affect faculty loads and facilities requirements. All of these factors are the common grist of the institutional research mill.

The critical variable in this scheme, the class size distribution, should be the focal point for the most basic kinds of institutional research. We know far too little about the real effects of class size on teaching method and learning response. We have not been able to anticipate the effect of innovations in instructional methods upon the class size factor. Yet, as has been noted many times by many commentators, class size is the critical cost variable, and it is the most significant factor in the planning of flexible instructional facilities. Without adequate knowledge of the qualitative utilities of size we are left with least cost as the criterion of academic decision.

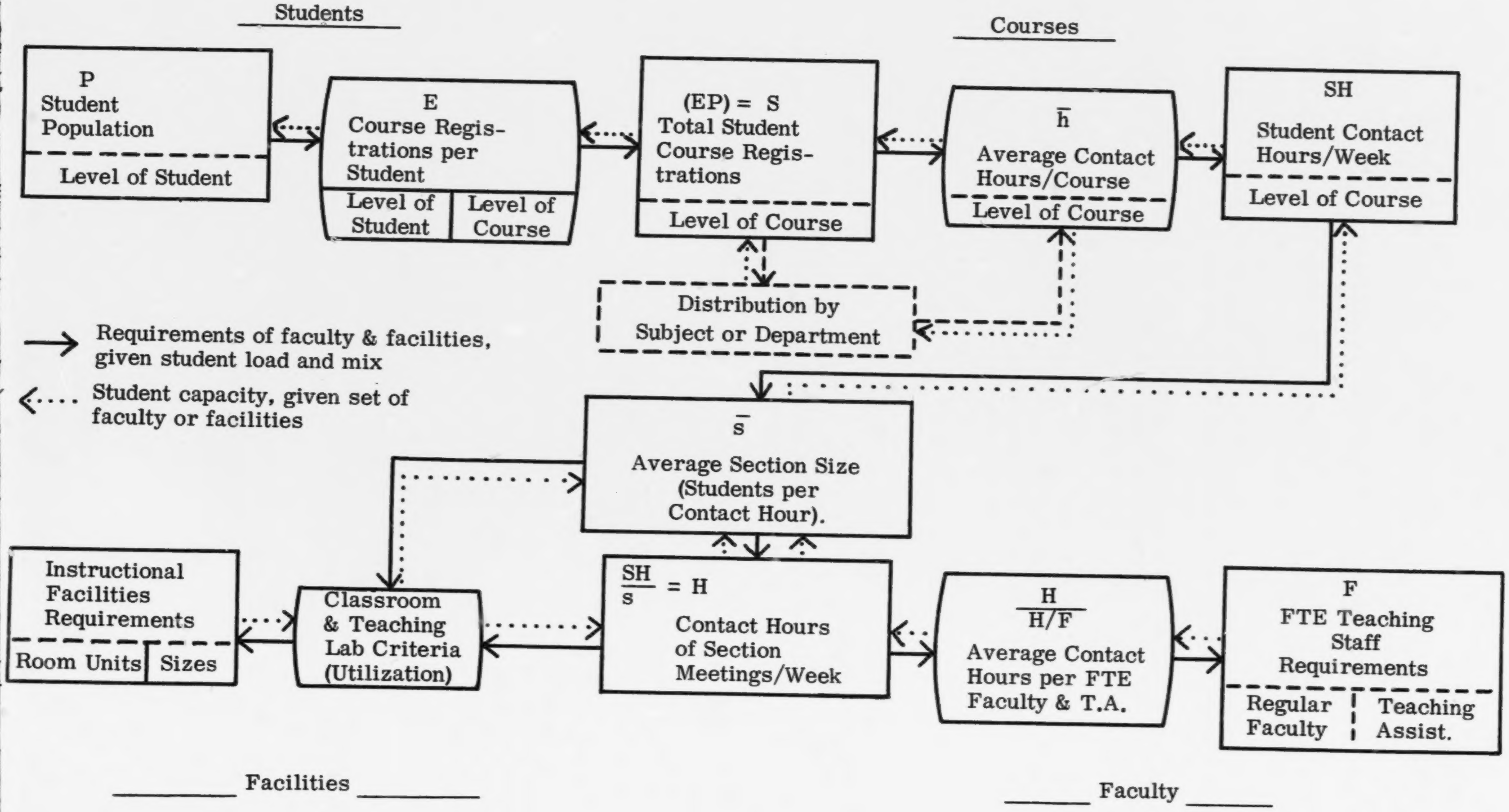
This elementary model of the typical North American college or university instructional program demonstrates that physical facilities planning must be integrated with total institutional planning, programming, and budgeting. To isolate physical planning from the continuing program decision system is to lose its value as a tool for long-range operations planning. Such isolation is a primary cause of dysfunctional facilities.

If we do a better job of comprehensive program planning, which the proverb says should precede physical planning, we can do a better job of defining the ranges and types of unpredictable change so that we can really describe to architects what we mean by flexibility. We can begin to delineate durable institutional functions with sufficient clarity so that we need not be chained to empty, ugly forms. We can do a better job of cost evaluation in relation to program needs and even such qualitative characteristics as aesthetics.

We may begin to approach that awful day when our plans for the future are so compelling that they become self-fulfilling prophecies; unpredictable change will have been eliminated; and it will all be very dull. We will shape our total systems, then they will shape us.

Figure A

Flow Chart: Model of University Instructional Program


Students
Courses
P
Student Population
Level of Student
E
Course Registrations per Student
Level of Student
Level of Course
(EP) = S
Total Student Course Registrations
Level of Course
$\bar{h}$
Average Contact Hours/Course
Level of Course
SH
Student Contact Hours/Week
Level of Course
Distribution by Subject or Department
Requirements of faculty & facilities, given student load and mix
Student capacity, given set of faculty or facilities
$\bar{s}$
Average Section Size (Students per Contact Hour).
Instructional Facilities Requirements
Room Units
Sizes
Classroom & Teaching Lab Criteria (Utilization)
$\frac{SH}{s} = H$
Contact Hours of Section Meetings/Week
$\frac{H}{H/F}$
Average Contact Hours per FTE Faculty & T.A.
F
FTE Teaching Staff Requirements
Regular Faculty
Teaching Assist.
Facilities
Faculty

University of Rochester
Planning
1-66

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PROBLEMS IN PLANNING HIGHER EDUCATION FACILITIES ON AN INTERINSTITUTIONAL BASIS

Frederick E. Schwehr
Board of Regents of
State Colleges of Wisconsin

The planning of facilities on an interinstitutional basis presents many problems because we are dealing with people as well as physical things. One of the major problems is that of communication--communication on all levels--governing bodies, university administrations, faculties, legislative bodies, architects, and the community.

Wisconsin has nine state colleges which recently became state universities with enrollments for the fall 1965 totaling about 38,600 students. These institutions range in populations from 2350 at WSU-Superior to 7133 at WSU-Oshkosh. At present no optimum size limit has been established for each institution. In several cases the Universities have or will very soon exceed the population of the city in which they are located, creating the serious problems of housing and feeding of resident students. These in turn evolve into additional problems of parking, recreation, and land acquisition. Herein lies a major problem of public relations between the institutions and the communities. Each community must be informed as to the growth of the University now and projected.

Of the nine Universities, three are laboratory oriented; Stout State University--Home Ec., Industrial and Vocational Education, WSU-Platteville--Engineering, Industrial Education and Agriculture, and WSU-River Falls--Agriculture. In addition, WSU-La Crosse is widely known for its physical education program. The remaining institutions are oriented toward the liberal arts. All of them offer graduate work on the masters degree level in the field of teacher education. Obviously this group of institutions will have varying philosophies and objectives. Further, branch campuses are appearing on the scene. All this adds up to the necessity for planning to be developed in an orderly manner based on a sound methodology with all participants having a knowledge of the cause and effect.

A number of years ago space projections were made by the "shotgun" approach. For example, in the State University system, the Coordinating Committee for Higher Education allowed 66 assignable square feet per student enrolled for instruction. This included classrooms, offices, laboratories, libraries, auditoria and support space. With nine institutions involved, with varying objectives, the functional needs were not met nor defined on an individual institutional basis.

Recently space factors, by function, were developed for each institution. The immediate reaction of the administrations and staffs was that the educational process was being hamstrung by the tyranny of the formula. After meeting with the individual institutional administrations, the methodology began to gain acceptance. People had to be made aware of why space factors are required and how they attempt to meet the needs. The needs and wants had to be separated. Critical needs appeared that previously had been shunted into the background. The administrators had a yardstick with which to work with their faculties. However, the faculties only gained an insight into the space factor concept by bits and pieces. To them, on the surface, it appeared that the central office was suppressing rather than aiding the educational process.

The rapport between administration and faculty has been slow and painful. Many institutional staff members do not know what a space inventory is, or that one exists. They do not realize that space factors applied against enrollments determine the required areas by function. The lack of understanding has hindered progress until the recent acceptance of need being determined by student contact hours on a departmental basis. Students generate contact hours and these in turn generate space needs and staff. Such a formula must, by example, be explained to the faculty.

The various governing bodies present a somewhat different problem in communication. Most of the persons concerned are busy at a different full-time position or are legislators concerned with many facets of the state's operation. For these people the explanation of the methodology and projected needs must be of an "over-view" nature. Give them the salient points in a logical sequential manner without a lot of educational jargon. One way to exemplify this is to develop what happened in Wisconsin this past fall. A restudy by the CCHE indicated that an additional 19,500 students more than estimated would have to be accommodated in 1968 by the 1965-67 Building Program. In addition, we have suddenly entered a period of construction cost escalation. We could not complete the current approved program within the funds allocated without cutting the size of buildings and creating a further space shortage. To further complicate matters, the state legislature planned to adjourn at the end of October until the following May, and it was already mid-October. We were six months behind schedule with our building program due to the aforementioned complications.

Before a request for additional funds and buildings could be made to the legislature, the governing bodies had to give their approval. Namely: The Board of Regents of State Colleges, The State Coordinating Committee for Higher Education, and the Wisconsin State Building Commission. Each of these groups has a different responsibility and therefore is concerned with varying data. The Board of Regents is concerned with meeting the needs at each individual institution. The CCHE is concerned with the broad picture of education in the state as a whole. The Building Commission is concerned with all state agencies and is responsible to recommend to the legislature a statewide building program with appropriate funding.

The first step was to develop a revised building program for the biennium. The following format was successfully used to obtain approval for the additional requests. Using a brief outline form:

1. The Table of Contents.
2. The Overview: All the pertinent information is summarized on two pages.
3. Enrollment Projections: Comparison of the original and new projections.
4. Space Factors: The broad concept.
5. Space Deficits: Based on new enrollment projections by institution.
6. Comparison of funds: Available as opposed to those required to complete the current program.
7. Buildings Required: By University, functional area, efficiency ratios, etc.
8. Active Instructional Area Needs Only: By Function for each University.

This approach worked for us and we received additional funding for the 1965-67 biennium through special legislation passed in the last few hours of the session.

The expanded building program created an additional problem of communication related to faculties and architects. We had to get the space allocations by function to our people, develop the program statements and transmit the needs to the architects. Our first move was to develop a guide for the preparation of program statements. Secondly, we held a seminar for the key persons responsible on each campus. In each case this was a person previously assigned as the liaison for all related facilities data. Incidentally, this person is generally on the level of a vice president and represents the administration where policy questions are concerned during facilities planning. The guide for preparing program statements is contained in the Appendix.

The problem of interinstitutional planning on a statewide basis is further complicated in Wisconsin because of certain statutory agency involvements. For example, the Board of Regents of State Colleges determines the needs but the Bureau of Engineering is responsible to design and supervise the construction of the environment to house these needs. This brings into the picture a private architect, his consultants, plus a representative of the Bureau of Engineering known in title as "Project Coordinator." These additional people add more confusion to the problem of communication. The Program Statement, no matter how well done, has to be interpreted. To accomplish this a kick-off meeting is held with the institution's project steering committee, architect, project coordinator, and the Board of Regents' representative. At this time the Program Statement is reviewed page by page. This eliminates immediately any assumptions that might be made through misinterpretation of the written word.

I have mentioned only one problem in planning on an interinstitutional basis. However, you can readily see this is a major one. Communication must be a two-way street if the needs of higher education are to be met.

APPENDICES

A GUIDE FOR PREPARING PROGRAM STATEMENTS RELATED TO ACADEMIC BUILDINGS AT WISCONSIN STATE UNIVERSITIES

Introduction:

After the need, amount of space by function, and the kind of facility to be constructed (i.e. science building, fine arts, etc.) have been established, it is necessary to provide a program statement for the architect to work from. The program statement may be defined as a complete set of educational specifications containing: (a) the general considerations, (b) summary of the program, (c) specific area descriptions, and (d) areas of future expansion anticipated at this time. The accuracy and completeness of the program statement cannot be over emphasized. The better the program statement the more adequate the facility.

The development of the program statement requires a steering committee composed of key faculty from each department to be housed within the proposed facility. It is imperative that the administration of the institution have representation on this team of educational experts in order to resolve various policy decisions that result during the formulation of the educational specifications. In addition, the Board of Regents will provide guidelines to be followed, the approved project budget and areas by function included in each building.

The above committee or team must be married to the project from its inception to completion if the facility is to meet the needs of the educational program and function properly. Hence, the educators determine the educational needs and the architect provides the environment to house those needs.

General Instructions For Preparing Program Statements

1. Each item of the format must be answered.

2. In the preparation of the program statement, the assignable space as approved by the Legislature cannot be exceeded. (Appendix "C")

3. The program statement should be assembled in the following sequence:

   a. General Considerations
   b. Summary of the Program
   c. Specific Area Descriptions
   d. Appendix: Areas of future expansion anticipated at this time.

4. All program statements should be mimeographed on 8-1/2 x 11-inch paper and stapled at least 3 times along the 11-inch left hand edge.

5. Be sure each page is numbered, dated, and in consecutive order.
6. The CCHE DEFINITIONS of space will apply to all projects. (Appendix A)
7. The recommended standards by subject area should be followed. (Appendix B)
8. Submit 12 copies of the program statement to the Board of Regents office by____________

PROGRAM STATEMENT FORMAT (Note: Each item must be answered.)

1. GENERAL CONSIDERATIONS:

1.1 Indicate the departments to be housed in the facility.

1.2 It is important that the design consider the future expansion of the facility should the need arise. The problem of land availability and utilization will then reflect itself in either vertical or horizontal expansion. (Copy statement verbatim.)

1.3 Information as to the expansion by department must be included. Will the departmental function change? Must these departments be designed now and in the future as homogenous units and not fragmented?

1.4 Any other pertinent relative information such as:

(a) Elevator
(b) Communications
(c) T.V. Conduit (specifically where?)
(d) Receiving and Freight Dock

FORMAT FOR SUMMARY OF THE PROGRAM

The definitions used to classify assignable space categories in this program statement are those described in the CCHE Definitions (Appendix "A"). The definitions used are for classrooms, teaching laboratories, offices, other active instructional space, and research.

SPECIFIC AREA DESCRIPTIONS FORMAT FOR INDIVIDUAL ROOMS

(Note: Each item must be answered.) (One sheet per room)

Room Name and Number:	(i.e. General Biology, Office, Interdepartmental, classroom, animal room, etc.)
No. Required:	(i.e. 10 Faculty Offices, etc.)
Location:	(i.e. spatial relationship to another area.)
Area:	In total assignable sq. ft. per room.
No. of Student Stations:	(i.e. 30 stations @ 35 sq. ft.)
Fixed Equipment:	(i.e. Lab Tables w/utilities, chalkboards, bulletin boards, only those items requiring permanent fastening to floor or wall. Every attempt should be made to specifically define the equipment. List only the equipment absolutely required for instruction.)
Movable Equipment:	(i.e. office desks, tablet arm chairs, wastebaskets, file cabinets.)

Services: (i.e. water, gas, electric, compressed air, etc.) (See following material on this page)

Equipment Now Owned and to Be Transferred:

A. Fixed
B. Movable

Special Requirements: (i.e. temperature and humidity control, special ventilation, sound control, room should be tiered, special lighting, black out shades.)

SERVICES: (ANSWER EACH ITEM)

Plumbing:
Heating:
Ventilating:
Electrical Power:
Lighting:
Communications:

APPENDIX "A"

NOTE: REPRODUCE ONLY THOSE APPLICABLE TO THE PARTICULAR BUILDING FOR WHICH THE PROGRAM STATEMENT HAS BEEN PREPARED

DEFINITIONS

Building Data

Building: Name of building; if name is not descriptive, indicate in parentheses nature of building (such as laboratory school, general classroom building, science building, physical education building, biology building, etc.)

Gross Square Feet: The gross floor area of a building is the sum of the areas at each floor level included within the principal outside faces of exterior walls, neglecting minor architectural setbacks and projections. Included are all stories or areas which have floor surfaces with clear standing head room (6 ft 6 in. minimum), regardless of their use. Excluded are all unroofed areas and unenclosed roofed spaces.

Net Square Feet: Square feet of floor area of all space in the interior of a building excluding structural elements such as walls and columns. This includes classrooms, laboratories, offices, etc., as well as such public spaces as corridors, toilet rooms, elevator spaces and stairways. Also included are mechanical equipment rooms, accessible pipe spaces, and floored areas in attics and basements (6 ft 6 in. headroom minimum). Generally this is any area which can be walked on.

Assignable Floor Space: The sum of the floor areas of the individual rooms assignable to the agencies housed in the building. Exclude the floor space devoted to activities such as the circulation of general traffic within the building, mechanical equipment rooms, accessible pipe spaces, janitorial closets, and public toilets. This figure also, of course, excludes the "floor area" of the building's structural elements (except as they exist to a negligible degree within the rooms).

Cubage: The cubic content (cube or cubage) of a building is the actual cubic space enclosed within the outer surfaces of the outside or enclosing walls and contained between the average outer surfaces of the roof and 6 inches below the finished surfaces of the lowest floors. The definition of cubage requires the cube of dormers, penthouses, vaults, pits, enclosed porches and other enclosed appendages to be included as a part of the cube of the building. It does not include the cube of courts or light shafts, open at the top, or the cube of outside steps, cornices, parapets, or open porches or loggias.

Room Number: Designate room number or identify by name or function, i.e. hallway, stairs, janitors' closet, etc. Every room or area must be accounted for and the total should correspond with the "net" area shown at the top of the sheet for that building.

Laboratory

Instructional rooms equipped for a specific purpose such as chemistry experiments, food preparation and service in home economics, shop work in industrial arts, painting, music practice, etc. Adjoining space such as balance rooms, storerooms, supply rooms, dark rooms or projection rooms should not be included as part of the laboratory but should be included in "Other" active instructional space.

A teaching laboratory should be distinguished from a research laboratory that is not ordinarily made available for class meetings.

Certain specialized rooms, such as those set up for instruction in business machines and accounting, drafting, sewing, biology, and band practice can generally be used also for lecture and recitation type class meetings. Notwithstanding this flexibility of usage, these rooms should be classified as teaching laboratories. They are equipped primarily for a specialized, laboratory-type instructional activity, and not for lecture and recitation-type classes.

Classroom

An instructional room used chiefly for lectures, recitation, and seminar type of class meetings. Other common terms for this are "non-specialized instructional space" and "lecture room".

"General classrooms" may sometimes be furnished with special equipment to serve the needs of a particular subject. For example, rooms used by classes in history may have wall maps, classrooms for mathematics may have extra blackboards, classrooms for foreign languages may have recording equipment, etc. A room should be classified as a "general classroom" if it is designed for lecture and recitation-type class meetings and if its equipment does not render it unsuitable for use by classes in almost any subject.

Office

A room or a suite of rooms with office-type equipment that is assigned to one or more staff members for the performance of administrative, clerical, or faculty duties other than meeting of classes. Auxiliary rooms such as waiting rooms, office file and supply rooms, interconnecting corridors within a suite of offices, and clothes closets should be included as part of the appropriate offices.

Office service areas which would not be included are those serving more than one department such as mimeograph rooms, general conference rooms, mailing rooms, etc.

A studio room in the department of music or fine arts assigned to one or more faculty members for their own work, even though occasionally used for a student lesson, should be classified as a faculty office.

Offices which are used for the functions of research, extension and public service, physical plant, library, laboratory school, inter-collegiate athletics, and other active purposes should be included in the areas designated for these functions.

Library

A room or a group of rooms used for the collection, storage, circulation, and use of books, periodicals, manuscripts, and other reading and reference materials. This category should include the general library, library offices, and rooms for special collections of documents, films, or records. Smaller libraries on the departmental or college level should be included in this category if they employ at least a half-time librarian. Teaching facilities for library science staff and students, even though located in the library building, should be classified as instructional rooms, and should be excluded from the inventory of "library space."

Auditoriums, Theaters, Assembly Halls

Any room possessing a stage, audience seating, and facilities for the purpose of presenting dramatic plays, concerts, and similar events. If the seating area is regularly used for scheduled class meetings, it can be prorated between classroom space and auditorium space on the basis of class hours assigned using a 44 hour week as 100%. For example, if the auditorium is used for eleven class hours, charge one-fourth of the area to classroom and three-fourths to auditorium. Fill out a form 1b for such classroom use. Dressing rooms, projection rooms and scenery rooms should be included in the general category of auditorium or theater area. Check rooms and ticket sales booths should be charged to auxiliary enterprises.

Other Active Instructional Space

Include all instructional areas not otherwise assignable to categories listed previously. Areas which serve only one laboratory, classroom or office should be classified on that particular form. Other service areas which are used by more than one laboratory, classroom or office, or by a department will appear on this form.

Research

Laboratories, offices, conference rooms, materials rooms, machine rooms, etc. used for research purposes. Where space serves two or more functions, it should be prorated among these functions, except that incidental amounts should be disregarded. Show breakdown by office, laboratory as previously defined, and other space. Library carrells and other library facilities directly assigned to research should be included in research area.

Extension and Public Service

Space for service directed to general public adult education, correspondence courses, public lectures, radio and television, state-wide service units (state chemist), public museums and exhibition rooms. Storage area devoted to extension and public service is included on this form.

Physical Education

Include all areas assignable to physical education except classrooms, offices, and areas devoted to intercollegiate athletics. Include gymnasiums, swimming pools, locker rooms, shower rooms and special purpose rooms such as handball courts, wrestling and boxing rooms, etc. Include seating areas to the extent that they accommodate student body in physical education area. Excess seating may be charged to intercollegiate athletics. For example: if you have an enrollment of 1500 and seating capacity of 3000, charge 1/2 of the area to physical education and 1/2 to auxiliary enterprises (intercollegiate athletics). Ticket offices, coat rooms, concession stands, and visiting team locker and shower rooms should be charged to auxiliary enterprises (intercollegiate athletics) but listed initially as physical education areas. Buildings devoted entirely to intercollegiate athletics should be included in the study.

Laboratory School

Include all areas assigned to the laboratory school function. Exclude areas which are used for collegiate instructional purposes such as college classrooms and offices. It may be necessary to prorate some rooms between the laboratory school and collegiate instructional functions.

Auxiliary Enterprises

All areas devoted to revenue-producing operations such as intercollegiate athletics, student unions, cafeterias, stores, clothing and book lockers rooms, student and faculty lounges and student organization rooms.

Physical Plant

Include all areas used for plant maintenance such as carpenter shops, electrical shops, maintenance storerooms, and boiler rooms in the main heating plant which support the entire campus. For example, a heating plant for a single building would not be included in this category but in non-assignable. Do not include mechanical equipment rooms or janitor's closets, as these are non-assignable areas.

Other Active Non-Instructional Areas

All areas not specifically assignable to one of the previous categories.

Inactive Areas

A category for the inclusion of all rooms that are not in use at the time of the space utilization study, because of new construction or alteration. This includes space which is not now being used but which has been built for future expansion. Also include areas that are inactive because of condemnation but which are expected to be returned to active use. For the purposes of a space utilization study, note should be made of the number of different kinds of inactive rooms and the square feet of floor space involved, but such data should be clearly distinguished from those reported for space that is in use or is available for use.

Non-Assignable Floor Space

All areas which cannot be assigned to a specific agency.

Circulatory Space. Include corridors, lobbies, hallways, stairs and stairwells, elevators and vestibules. Waiting rooms which are walled off from the hallway and are used in conjunction with specific offices should be included under office space. Waiting rooms which are a part of the corridor or vestibule should be included in this category.

Rest Rooms. All rest rooms should be included. Faculty and student lounges should be included in auxiliary enterprises category.

Custodial and Service Space. Include janitorial closets, furnace and boiler rooms (except in main heating plant), pipe space areas, and mechanical equipment rooms. The central heating plant is a physical plant space and should not be shown in this category.

Non-Usable Space. Include such areas as attics and unfinished basements which are floored with minimum head room of 6 ft. 6 in. even though such space may sometimes be used for dead storage. Space which has been condemned and it is not expected that it will be returned to active use should be included.

Summary of Assignable and Non-Assignable Area

Building. Give the name of the building as it appears on the building data form. Use a separate sheet for each building.

Room No. List in numerical order every room in the building including halls, storage, and all floor areas. Take area as it appeared on appropriate special form.

Department. If possible, give the department to which the room is assigned.

Square Feet of Floor Space. Give total square feet of room in this column. This should equal the totals assigned to the different functions if the room has more than one use.

Number of Student Stations. Refers to classrooms and laboratories.

Student Occupancy. Leave this space blank.

Distribution of Area by Function. Give the square feet of space assigned to each function. The total of the assignable and non-assignable space should equal the square feet on column 3 and also should agree with building data forms as well as the specific forms for each type of space.

APPENDIX "B"

SPACE GUIDELINES

1. GENERAL

1.1 The assignable sq. ft. are spelled out by function for each project. The assignable sq. ft. cannot be exceeded as it is directly related to the budget approved by the Legislature.

1.2 Program statements which exceed the approved ASF area will not be accepted by the Building Commission when requests are made for planning funds.

2. CLASSROOMS

2.1 General	Sq. Ft. S.S.
a. Fixed Seating	12 sq. ft.
b. Movable Seating	15 sq. ft.
c. Seminar	20 sq. ft.

2.2 Guide for Classroom Sizes

a. 15 station classroom (Seminar)	20
b. 30 station classroom	15
c. 45 station classroom	14
d. 60 station classroom	13
e. 125 station classroom	10
f. 250 station classroom	9

2.3 An examination of the most common section sizes must be made in order to relate the section sizes to the room capacities in order to determine the number of rooms required by capacity.

2.4 The CCHE utilization standard will apply: 30 periods per week per room of scheduled use with 67% station utilization

2.5 It should be noted that classrooms are all-campus facilities to be used interdepartmentally.

3. TEACHING LABORATORIES

3.1 The CCHE utilization standards will apply: 24 periods per week per room with 80% of the stations utilized.

3.2 Recommended Average Square Foot Per Student Station by Subject Field for Teaching Laboratories

Subject Field	Sq. Ft. Per Station
a. Biological Sciences	40
b. Chemistry) organic 50) inorganic 70) general 30) quant. 50	50, 70, 30, 50
c. Geology	30
d. Psychology	40
e. Physics) General 35) Nuclear 45	
f. Speech (Listening Labs)	50
g. Art	60
h. Education	40
i. Business Education (Typing, Shorthand)	30
j. Drafting General	35
k. Drafting Architectural	60
l. Agriculture	60
m. Home Economics	50
n. Languages	30
o. Ag. Shops	100
p. Ind. Tech. & Engr.	150
q. Music Rehearsal	20

4. OFFICES

4.1 The CCHE standard shall apply: The over-all average for all occupants is 120 sq. ft.

4.2 Individual faculty offices should range between 100-117 sq. ft. depending on function. (i.e. engineering and allied functions may require the higher area due to equipment.)

4.3 Department Head offices, including secretary, should range between 180-220 sq. ft.

5. MUSIC ROOMS

5.1 Practice Rooms

These should range between 60-72 sq. ft. and will be available 44 periods per week with 100% station use.

5.2 Studios

These should range between 180-220 sq. ft.

6. LIBRARY

6.1 Reading Rooms: Seat 20% of the enrollment at 25 sq. ft. per station.

6.2 12 vols. per sq. ft. of stack space @ 3 sq. ft. of stack space per student enrolled.

APPENDIX "C"

PROJECT SUMMARY FOR____________________
BUILDING AT WISCONSIN STATE UNIVERSITY__________
AS APPROVED BY THE LEGISLATURE

Project Budget[1] __________

Est. Cost Per Gross Sq. Ft.__________

Functional Area	Assignable Sq. Ft.
Classrooms	______
Teaching Labs	______
Offices	______
Library	______
Phy Ed	______
Research	______
Other Active Instructional Space	______
Total ASF	______
Total GSF	______
% of GSF-Assignable	______

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[1] Excludes land and utilities.

TRENDS IN THE CHARACTERISTICS OF ENTERING COLLEGE STUDENTS, 1961-1965

Alexander W. Astin
American Council on Education

Although the current folklore of higher education is replete with stories about the burgeoning number of college applications, the increasing selectivity of colleges, the "closing college door," and the "changing character" of the college student, very little empirical evidence about such trends is actually available. Such evidence is needed, not only to replace the folklore with fact, but also to provide an empirical base for formulating future policy on the education and development of skilled manpower.

This report presents some recent empirical findings about trends in the characteristics of entering college students between 1961 and 1965. Data on the entering freshman classes of 1961 were available from an earlier study of student input at 246 colleges and universities (Astin, 1964a, 1964b, 1965); data from the entering classes of 1965 were collected during the pilot phase of a project designed to establish a national research data bank for higher education (Astin and Panos, 1966; Panos and Astin, 1966). (The relation of the data bank project to the findings of the present study will be discussed later in the paper.) The analyses of trends will be confined to data obtained from the 45 institutions common to both studies.[1]

The procedures for collecting data in the two studies were as follows. During the fall freshman orientation or registration periods, each entering freshman completed a brief information form. The 1961 form contained 26 items about the student's socioeconomic background, high school achievements, educational aspirations, and vocational plans. The 1965 form contained a more heterogeneous assortment of 104 items, including nine of the items from the earlier 1961 form. These nine common items, which represent the best measures of the six common factors found in the 1961 data (Astin, 1965), will serve as the basis for our analysis of trends during the four-year interval. The items are:

> sex; father's educational level (six steps: from grammar school to post-graduate degree); grade average in high school; probable major field in college (post-coded into seven broad categories); highest degree planned (scored both as the percentage planning graduate work and as the percentage seeking the Ph.D. degree); and four extracurricular achievements: had a major part in a play; received a rating of "good" or "excellent" in a regional or state music contest; won a prize in an art competition (sculpture, ceramics, painting, etc.); published poems, articles, or short stories.

Selected characteristics of the sample of 45 institutions are shown in Table 1. The mean for the institutional population on each variable has been set at 500, and the standard deviation at 100 (Astin, 1965). The entering freshman classes of the 45 institutions tend to be more intellectual and masculine and to be of higher socioeconomic status than entering classes-in-general. The sample also tends to be more selective and wealthier than the general population. In terms of variability, however, the sample tends to be comparable to the population, except in size of enrollment; on this variable the sample is somewhat more homogeneous than the population.

Although these data reveal moderate biases in the mean characteristics of the 45 institutions, the representative variability found in the sample indicates that the relationships among the input variables under study have not been seriously affected by the sampling bias. Size, which is the only institutional characteristic where the sample differs substantially from the population in variability, has virtually no relationship with other freshman input characteristics (Astin, 1965, p. 30).

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[1] Three additional institutions that were used in both studies have been omitted, since the 1965 data were obtained from only a portion of the entering freshman class.

TABLE 1. Characteristics of the Sample of 45 Institutions

Institutional Characteristic*	Mean	Standard Deviation
Estimated Freshman Input Factors:		
Intellectualism	563.8	103.4
Estheticism	511.6	94.3
Status	562.8	99.0
Pragmatism	516.4	81.3
Masculinity	530.1	81.6
Selectivity	556.8	115.3
Size	516.7	69.9
Per Student Operating Budget	536.5	92.2
Percentage of Males	531.3	96.9

* As reported in Who Goes Where To College? (Astin, 1965). The mean and standard deviation of the population of four-year accredited institutions have been set at 500 and 100, respectively, for each institutional characteristic.

Results and Discussion

Table 2 shows the 1961 and 1965 means and standard deviations for the 45 institutions on each of 17 student input characteristics. The standard deviations shown in the last two columns of Table 2 can be used to estimate variability within the sample on each input characteristic. An increase in a given standard deviation between 1961 and 1965, for example, would indicate that the institutions had become more heterogeneous with respect to that input characteristic. Actually, the two columns of standard deviations show very little change between 1961 and 1965 in the relative differences among entering freshman classes. The data on high school grades, father's educational level, and the student's educational aspirations indicate only a very slight trend toward greater homogeneity among the entering classes. These results run somewhat counter to the current folklore, which implies that differences among student bodies are becoming more extreme because of the ever-increasing selectivity of a few "elite" institutions. Since the variation within the sample on both selectivity and wealth was considerable (see Table 1), this finding cannot be dismissed as an artifact caused by the pecularities of our sample.

A comparison of the 1961 and 1965 means in Table 2 reveals some interesting trends over the four years in the characteristics of entering freshmen. Of special interest is the large increase in the percentage of students planning graduate study. The implications of this trend for the administrator are clear: if the graduate and professional schools are not prepared to accommodate this unprecedented onslaught, the guidance personnel at the secondary and undergraduate levels must seriously reconsider their attempts to encourage so many students to continue their education beyond the baccalaureate level. The fact that this pronounced increase in the entering students' educational aspirations has not been accompanied by a comparable improvement in their academic performance in high school suggests that the proportion of students with unrealistic vocational plans is becoming greater. On the other hand, if the graduate and professional schools are willing and able to accommodate these additional students, then the average academic ability of graduate and professional students will necessarily decrease over the next few years.

TABLE 2. Entering Freshman Classes at 45 Institutions:
Changes in 17 Student Input Characteristics Between 1961 and 1965

Student Input Characteristic	Means 1961	Means 1965	Standard Deviations 1961	Standard Deviations 1965
Percent males	58.5	58.1	26.3	26.0
Median high school grade point average*	3.04	3.08	.36	.34
Median level of father's education**	13.8	14.2	1.6	1.5
Percent planning graduate study	48.6	67.4	20.3	15.3
Percent seeking Ph.D. degree	23.7	30.4	18.4	17.8
Percent majoring in:				
Arts and Humanities	16.0	21.3	9.0	8.4
Biological Sciences	4.0	6.8	2.6	3.7
Business	6.8	7.5	7.6	8.9
Education	9.1	6.4	8.1	7.4
Engineering	5.6	4.2	8.2	6.4
Physical Sciences and Math	13.9	14.3	9.9	9.7
Social Sciences	8.3	12.9	5.3	5.9
Undecided on major	21.7	15.5	5.8	6.7
Won high rating in state music contest	9.7	10.8	6.5	5.6
Had a major part in a play	25.2	23.1	6.3	5.6
Published original writing	10.5	24.3	4.7	9.2
Won a prize in an art competition	4.9	5.6	2.6	2.4

* Grade-point averages are calculated on a 4-point (A=4) scale.
** High School graduate = 12 years; college graduate = 16 years, etc.

The distributions of major fields shown in Table 2 also reveal some interesting trends. There has been a decline in the percentages of students choosing education and engineering, and an increase in the percentages choosing arts and humanities, biological sciences, and social sciences. The percentages choosing business, physical sciences, and mathematics show relatively little change. It should be noted that these increases are probably attributable in part to the drop in the proportion of undecided students. If the undecided students are excluded in computing both sets of percentages, the gains become less pronounced, and the decreases for business and education become greater.

Although it is difficult to say with any certainty why these particular shifts in the chosen major fields of entering college freshmen have occurred, some tentative explanations can be proposed. One possibility, for example, is that the greater popularity of the humanities and the social sciences reflects students' increased concern with political causes and with problems of social change in general. An alternative explanation is that these trends are simply the result of the increased interest in graduate training mentioned earlier: that is to say, the humanities and the social sciences are more appropriate fields for the pursuit of the Ph.D. and other graduate degrees than are the fields of business and education.

Table 2 suggests that the frequency of extracurricular accomplishments changed little between 1961 and 1965, with the exception of "published original writing." However, the apparent increase in the frequency of this achievement may be partially attributable to a slight modification of the item: a qualifier in the 1961 version which excluded articles published in the high school paper was omitted in the 1965 version.

Additional analyses of these four-year trends were performed by correlating each 1965 student input characteristic with a variety of 1961 data. Some of these results are shown in Table 3. The first column of coefficients in Table 3, which shows the correlations between the 1961 and 1965 input measures, indicates that differences among institutions in most student input measures change very little over time. In particular, differences among the entering classes' average high school grades, educational aspirations, and father's educational level appear to have remained very stable during the four-year interval. The percentages of entering students planning to study business, engineering, and physical sciences or mathematics also reveal that institutional differences remain much the same. The least stable differences in institutional inputs are the percentage of students who are undecided about their major fields and the percentage who report receiving awards in art during high school.

TABLE 3. Prediction of 1965 Student Input Caracteristics from 1961 Data

Student Input Caracteristic	r between 1965 and 1961 means	Partial r (1961 measure held constant) between 1965 measure and Institutional Selectivity
Percent males	.98	.01
Median high school grade point average	.91	.35*
Median level of father's education	.97	.06
Percent planning graduate study	.92	.20
Percent seeking Ph.D. degree	.96	.33*
Percent majoring in:		
Arts and Humanities	.83	-.21
Biological Sciences	.75	.06
Business	.92	-.20
Education	.84	-.30*
Engineering	.97	.06
Physical Sciences and Math	.94	.01
Social Sciences	.86	-.08
Undecided on major	.40	.42**
Won high rating in state music contest	.87	-.22
Had a major part in a play	.80	.06
Published original writing	.79	.49**
Won a prize in an art competition	.56	.13

* $p < .05$
** $p < .01$

Although these findings show fairly conclusively that differences in student inputs are very stable, the fact that the correlations were less than perfect indicates that some differential changes in student inputs have occurred during the past four years. In order to discover some of the possible influences on these differential changes, partial correlations were computed between several institutional characteristics and each 1965 input measure, holding constant the effects of the relevant 1961 input measure. In short, these analyses were performed to determine if differential changes in student inputs could be predicted from institutional characteristics such as size, selectivity, type of control, and geographic region. The only institutional characteristic that yielded more than one statistically significant partial correlation with the 17 input measures was selectivity -- an estimate of the relative concentration of highly able students in the student body (see Astin, 1965). These partials are shown in the last column of Table 3. The two largest partials ($p. < .01$) suggest that students who have previously published original writing and students who are undecided about their choice of a major field have become increasingly concentrated in the more selective institutions. This conclusion is consistent with the observed increase in the variance among institutions on these two measures (Table 2).

The positive partial correlations of selectivity with the students' grades and educational aspirations would suggest that the more talented, more motivated students are becoming increasingly concentrated in the selective institutions. However, this conclusion may not be warranted, since the institutional variance on these two measures (Table 2) actually decreased slightly between 1961 and 1965.

It is important to note here that the method used to measure trends is likely to affect the conclusions about what factors influence trends. Thus, if we were to define a "trend" simply as the absolute change in a given input measure (i.e., 1965 minus 1961), we would reach conclusions somewhat different from those stated in the previous paragraph. Selectivity, for example, would no longer show any relationship to changes in the median grade-point average or in the percentage planning to get Ph.D. degrees; instead it would show a substantial negative relationship (-.45) to change in the percentage planning graduate work. However, our conclusions regarding the effects of selectivity on changes in the percentage of undecided students and the percentage of students who published original writing would not change if this alternative definition of change were used. The purpose of this discussion is not so much to debate the relative merits of different types of change scores, as to emphasize that the conclusions may vary, depending upon the particular measurement technique used.

In spite of these qualifications, the potential value of such analyses of trends in student inputs is clear. Even with the relatively small sample of 45 institutions, it has been possible to demonstrate several important facts:

1. Differences among institutions in most student input characteristics are highly stable over an interval of four years.

2. There is no clear evidence, at least among the four-year institutions, either that the institutions are becoming increasingly selective as a group or that the gaps among institutions in relative selectivity are widening. However, those students who have published original writing prior to entering college seem to be increasingly concentrated in the more selective institutions.

3. Several major changes in the educational and career plans of entering freshmen have occurred during the past four years. These trends may have important implications for educational policy, guidance and counseling, and manpower planning.

Perhaps the major limitations of the data presented here are the relatively small size of the institutional sample and the availability of measures at only two points in time. The analyses of factors influencing trends, for example, might have proved to be more definitive if trends could have been plotted for a greater number of institutions at several different time points. In the ACE higher education data bank mentioned earlier, standardized information on student input characteristics will be collected annually from a stratified national sample of approximately 300 colleges and universities. Although the major function of this project will be to conduct longitudinal studies of student development, the data bank will make it possible routinely to monitor trends in the distribution of entering students for an extended period of time. By monitoring these input data regularly, we shall attempt to detect and analyze trends in a variety of student input characteristics almost as they occur. It is our hope that these studies will provide both a corrective for the educational folklore, and -- more importantly -- a sound empirical basis for educational theory, research, and planning.

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PROBLEMS OF SELECTION AT A SMALL, SELECTIVE COLLEGE

Ruth Churchill
Antioch College

I would like to share with you a few of the problems of selection of students and prediction of success for students at one small, selective college. While some of these problems are peculiar to a small, selective college, others are old friends to all of us.

Naturally, the Admissions Office would like to select students who will be successful; to that end they obtain high school records and CEEB scores, interview candidates, obtain references, and require candidates to answer questions and write short autobiographies. When they say that they weigh all of these materials and that no set minima obtain, they are accurate although it may be hard to convince applicants of that fact. Two quantitative summaries of data are made to help in making decisions in a prediction of first-year cumulative average based on rank in high school class and SAT Verbal and Mathematics scores and an over-all judgment of the candidate's folder made by the admissions staff. These two are not independent since the high school record and test scores form part of the folder. In our studies these two measures have each correlated between .40 and .50 with first-year grades. Thus, current admission procedures are helpful in predicting first-year grades but the accuracy of the prediction is not startlingly high.

Several explanations may be advanced for this relatively low level of prediction. First, selection of students on the predictive variables is considerable, in average scores on the CEEB Scholastic Aptitude Test are above 600 and rank in high school class has a median at about the 90th percentile. Variability on all these measures is restricted. But other colleges are more selective and at the same time more predictable. Freshman grades follow a set pattern; boys receive grade-point averages of 2.5 and girls average 2.6. It sometimes seems scarcely worthwhile to calculate this statistic since it never varies. Incidentally no faculty policy obtains; it is a demonstration of an undiscussed consensus--grades for freshmen should average half-way between B and C. This unwritten consensus limits prediction since the middle two-thirds of grades range from 2.0 to 3.0. Perhaps since Antioch does experiment in its program, first-year grades are based on experiences different from high school and should not be too predictable.

Much has been published on how to improve prediction of first-year grades. Even without using technical refinements, I think we could probably improve our predictions. For example, the data suggest that we should supplement the Scholastic Aptitude Test with the CEEB English Composition Test and other CEEB achievement examinations.

At this point we have chosen to direct our attention in a different direction, to the problem of the criterion itself. Without criticizing grades, as is now fashionable, grades in the first year of college constitute a limited criterion for evaluating success in college as a whole. Moreover, we are currently experimenting with an ungraded first year. Thus, we have to turn our attention to the problem of developing multiple criteria of success in college.

In developing multiple criteria we have had several standards for selection in mind. First, do the criteria reflect the practical problem? Our crucial problem is that while we currently accept no students who lack the ability to do college work, we still have substantial numbers who fail to graduate or who, if they do graduate, encounter many difficulties or create difficulties for others. Second, are the criteria readily obtainable from students' records? This standard reflects a conviction that we have been wasting information routinely obtained and entered on each student's record; or that we need to learn what additional data should be entered. Third, do the criteria reflect all aspects of the program? In other words, are the college's stated objectives reflected in the criteria? For example, while Antioch has a work program, no attempt has ever been made to predict success in that program. Fourth, are the criteria obtained varied in character? Grades, ratings, scores on objective tests, observations of behavior, self-reports all have different strengths and weaknesses; reliance on any one source of information exclusively is probably limiting.

At this point I would like to present a list of the criteria so far developed to illustrate how the foregoing standards have been met and on what variety of standards we have been able to obtain data. Table 1 presents a list of the criteria so far developed.

TABLE 1. Criteria for Success in College

I Academic criteria
  A. General academic criteria
    1. Grade-point average
      1.1 Cumulative for first year
      1.2 Cumulative for first and second years
      1.3 Cumulative for first, second, and third years
      1.4 Cumulative for first, second, third, and fourth years

    2. Nominations by faculty as outstanding student in upperclass courses
      2.1 By total faculty
      2.2 By faculty outside major field

    3. Plans for further training

  B. Criteria related to general education
    1. Scores on the GRE Area Tests
    2. Scores on test of reasoning skills (locally constructed)

  C. Criteria related to major field
    1. Scores on the AGRE test in the field
    2. Nominations as outstanding by faculty in the field

II Criteria related to work experience
    1. Job ratings
      1.1 Cumulative for first year
      1.2 Cumulative for first and second years
      1.3 Cumulative for first, second, and third years

    2. Nominations by extramural faculty for outstanding job performance

III Criteria related to community (social and personal development)
    1. Deans' estimates of problems in freshman year
      1.1 Questionable behavior
      1.2 Personality difficulties

    2. Nominations by deans for outstanding contributions to community

    3. Changes in students' educational and vocational goals from freshman to senior year

    4. Students' statements of perceived changes

    5. Changes in students' values and attitudes--scores on the OPI (Omnibus Personality Inventory)

IV Over-all criteria
    1. Survival
      1.1 Withdrawals
      1.2 Number of years at Antioch
      1.3 Survival to senior year
      1.4 Graduation

    2. Nominations as outstanding in academic, job, and community areas.

From this list you can see that we have arrived at a comprehensive list of available criteria. The only criteria specially collected were deans' estimates of problems (which they make routinely), faculty nominations, and senior responses to a questionnaire and to the OPI. The problems relate to the handling of these criteria and fall into two categories. One is that of sheer amount. The fact that these have been assembled reflects the impact of the computer. Without it, multiple criteria are unmanageable; with it, the need for sophisticated statistical techniques is pressing. There are problems involved in organizing the criteria, in predicting criteria with different statistical characteristics (ordered vs. non-ordered), in analyzing profiles of criteria, in measuring change, in combining criteria. The other facet of the problem is that with so many criteria one is tempted to forget that explicit hypotheses need to be stated and tested and that at this point all of the hypotheses formulated are limited to the relation between personal characteristics of students and success in college and do not deal with the interesting question of the interaction of college program with student characteristics to produce given results.

This last statement leads to the question of predicators. Having developed this array of criteria defining success in college, what independent variables are being used to predict them? At this point the independent variables are limited exclusively to personal characteristics of students at entrance. These are listed in Table 2.

TABLE 2. Independent Variables: Personal Characteristics of Students

I Aptitude and achievement variables
  1. Rank in high school class

  2. Aptitude tests
    2.1 CEEB Scholastic Aptitude Test-Verbal
    2.2 CEEB Scholastic Aptitude Test-Mathematics
    2.3 Yale Educational Aptitude Battery-Verbal Reasoning
    2.4 Yale Educational Aptitude Battery-Quantitative Reasoning
    2.5 Yale Educational Aptitude Battery-Spatial Relations
    2.6 Yale Educational Aptitude Battery-Mechanical Ingenuity

  3. Achievement tests
    3.1 CEEB English Composition
    3.2 Essay (local)
    3.3 Math Skills (local)
    3.4 Humanities Achievement Exam (local)--history, philosophy, literature, arts subscores
    3.5 Social Science Achievement Exam (local)--psychology, sociology, economics, political science subscores
    3.6 Physical Science Achievement Exam (local)--chemistry, mathematics, physics, biology, earth science subscores
    3.7 Credit earned by examination
    3.8 Number of examinations passed
    3.9 Total performance on three achievement examinations

II Personality inventories
  1. Omnibus Personality Inventory--ten scales

  2. Kuder Preference Record
    2.1 Nine scales
    2.2 Six derived indices--practical, physical science, biological science, social science, humanities, theoretical

  3. Educational and vocational goals (local questionnaire)

III Background
  1. Family and personal background (local questionnaire)

I should attempt to state my central question at this point: Can specific predictors (personal characteristics of students) be linked to specific types of success to be predicted? Can predictions of success be made in terms of the ways in which students will succeed? Will such differential predictions allow us either to improve selection (by identifying, for example, academically able students who will encounter such severe personal problems as to have little chance of graduating) or to improve our educational methods (by modifying aspects of the educational program associated with particular kinds of failures)?

At this point it may be helpful to descend from an abstract level to report on some of the first results. So far we have concentrated on predicting first, second, third, and fourth year cumulative averages, number of years at Antioch, attaining senior status, freshman problems, questionable behavior in the freshman year, and personal problems in first year. As predictors we have used only the aptitude and achievement variables. Thus, we have selected three different types of criteria--general academic, personal-social, and over-all--and one type of predictor. The statistical technique employed has been step-wise multiple regression. The criteria are being predicted one at a time and not in combination.

It is interesting to give the results for grade-point average for three groups: first-year cumulative for every one who survived one year (only 8 of our 417 students had no first-year cumulative average), first-year cumulative for those who survived four years, and fourth-year cumulative for those who survived four years. For the men, the most important predictor is always rank in high school class (.43, .39, .40). An achievement measure always enters second, and aptitude measures are third. The particular achievement measure varies, however; for freshman grades it is scores on our humanities examination, while for fourth-year grades it is number of achievement examinations passed at entrance, an over-all measure. The aptitude measures that enter are spatial relations and mechanical ingenuity. (The verbal and quantitative measures have apparently already been covered.) The multiple R's based on the first five predicators are .51, .49, .48. For the women, the most important predictor is always the sum of the scores on all three achievement examinations taken at entrance (.44, .44, .45) followed by rank in high school class, followed by scores on the CEEB English Composition Test, followed by an aptitude test, spatial relations. The final multiple R's are .56, .60, and .60. These findings have an interesting implication. First-year grades on students surviving at least one year can be used to represent cumulative grades for four years for this group of students--although this fact is clearer for the women than for the men.

For all students who completed one year of college it is possible also to predict withdrawal from college and problems in the first year. As expected, the predictions of survival and freshman problems are substantially poorer, using aptitude and achievement variables. Instead of accounting for 25 to 36 per cent of the variance in the criterion, as is the case with grades, the multiple R's for survival are .31 for the men and .36 for the women and for problems are .41 and .34, representing only 10 to 17 per cent of the variance. For the men, the most important variable is rank in high school class (.22 for survival and .26 for problems). With one exception the other variables involved are also achievement measures, not aptitude. It is interesting to note that scores on the humanities examination are a negative factor; they were a positive factor in predicting first-year grades. For the women, no clear pattern emerges; survival is related to achievement measures and rank in high school class, and problems to aptitude measures--spatial relations and mechanical ingenuity. The role of one aptitude variable is particularly interesting. This is CEEB-Verbal minus Mathematics plus 500, a measure of verbal bias. This generally enters as a negative factor; the more verbal bias, the less chance of survival and the more problems. This variable is unrelated to grades. The important conclusion, however, is that by and large aptitude and achievement factors fail to predict both survival in college and problems in the freshman year.

The next step, of course, is to complete the organization of the predictive variables and the criterion variables so that they can all be tested against each other to determine whether there will be differential prediction of criteria. Certainly the preliminary stages suggest that there will be.

SELECTION OF STUDENTS BY COLLEGES WITHIN A STATE SYSTEM[1]

John R. Hills
Florida State University[2]

First let me describe briefly the context within which lies my experience in college admissions, working in the central office of a large and rapidly-expanding state-wide program of public higher education. With a single exception, all tax-supported colleges in Georgia are governed by a single Board of Regents, on whose staff I seem to be responsible for admissions because admissions in Georgia involves testing. All entering freshmen in public colleges, and in nearly all private colleges, must present Scholastic Aptitude Test scores with the applications for admission. The public colleges include Georgia Institute of Technology, the University of Georgia, Georgia State College, and the Medical College of Georgia--all universities in the sense that they grant the doctorate degree, a dozen four-year colleges, five junior colleges with four more being built and three more in some phase of planning and development, and numerous kinds of branch units, extension services, and so on. This means that we must have nearly every kind of admission problem, except perhaps that of California Institute of Technology faced with three National Merit award recipients for each opening in the freshman class.

Diversity vs. Comparability

One of the most fundamental issues in admissions in a System is the competition between the idea that higher education should be so diverse that there is a place in it for everyone and the idea there should be some consistency in the implications to be derived from knowing that an individual has graduated from college or has completed two years of college. It is so pleasant to make believe these ideas are compatible that the notion is seldom resisted. No one would arbitrarily make it impossible for another person to improve himself through higher education. We would especially like the citizenry to avail itself of higher education because there is a lot of propaganda that more education automatically leads to the pot of gold at the end of life's rainbow. Certainly, it seems that those who cannot support themselves without the help of welfare tend to be among those with less education. If they could be educated, and if that automatically led to their self-support, their higher education would be a goal devoutly to be desired.

If all citizens are to be educated and if the educating is to take place in institutions of higher education, then indeed admissions standards will have to be minimal or nonexistent. The danger in minimal admissions standards is the able, well-prepared students will be quite disappointed in what can take place in a class largely attended by poorly-prepared, academically untalented, and relatively disinterested students, who are being educated in order to be able to support themselves through gainful employment. In fact, it is unlikely that both the academically talented and the unprepared and untalented can have their differing objectives well served by the same presentation of the same material in a common class. What good is it to try to teach differential calculus to a class composed of students ranging from the disinterested, socially-promoted graduate of a high-school vocational curriculum to the graduate of the college algebra class of a preparatory school? One kind of student or the other is going to find that his time is being wasted. The institution is faced, then, with choice of one of two alternatives. Either it can admit only one group or the other or at least tend to restrict itself to some particular group it is motivated to serve well, or else it can admit everyone but after admission sort the students out into classes relatively homogeneous in preparation, talent, and objectives. Either solution is logically one of selective admission, either to the college or to the course in the college. This is the dilemma which results in selective admission and also in diversity of admission standards among different institutions.

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[1] The opinions expressed here are those of the author, they do not necessarily reflect the views of the State of Georgia, the Board of Regents, or the Chancellor of the University System.

[2] Formerly Director of Testing and Guidance of The Board of Regents of the University System of Georgia.

Diversity of admission standards leads directly into the next problem. I was recently called by a member of the personnel department of a large manufacturing concern in Georgia which reported that the company was being required to hire applicants with "two years of college or the equivalent." He wanted me to tell them how to determine whether an applicant had the equivalent of two years of college. My reply could only be, "Which college?" This is the problem of comparability. If college education leads to the pot of gold, would someone please reassure me that it leads to the same amount of gold no matter which college, which curriculum, what kind of performance, or how much talent is possessed by the participant? What is there about technical-vocational post-high-school education that causes the propagandists to leave it out when they talk about the financial value of a "college education"? The problem is especially serious in an organized system of colleges because of the well-documented phenomenon called, at least since 1925, transfer-shock. Basically, the student who enters and attends a college with low admissions standards, such as are typical of junior colleges, usually discovers that his grades plunge downward upon transferring to a senior college which was selective in admitting freshmen. (Hills, 1965) By seeking to serve all kinds of people through diversity of admissions standards, we have destroyed comparability so that when one part of education is supposed to blend naturally into another, it does not fit well. The result is large-scale drop-out of transfers, failure to graduate from the four-year college, delay in graduation from the four-year college, etc. If the goal was a four-year college degree, we may have defeated our purpose even for prepared and talented students if they started in an open-admissions college and did not learn to swim with those in the fast stream who are going to survive to graduation.

In a university system which encompasses all of public higher education, how can one provide diversity and yet assure comparability? The problem is not easy to solve. On one occasion administrators of all the colleges in the University System of Georgia gathered together to compare notes on the minimum probability of obtaining a C freshman average that would permit an applicant to be admissible to their institutions. Going around the table, their ideas of minimum standards for admissions ranged all the way from one chance in a hundred of earning a C to 50 chances in one hundred of earning a C. Needless to say, it was not possible even through extensive work of committees and subcommittees to get any agreement on a minimum standard that all would accept or on minimum standards that could apply within groups or types of colleges, or even anything more concrete than agreement that each college would require applicants to have a reasonable probability of success in order to be admitted. The words "reasonable probability" and "success" were left undefined because we could not agree on what they should mean. As a result, we have on paper a statement of common admissions standards which apply throughout the System but which means nothing because the words in it are undefined and are recognized as being subject to widely different interpretations.

Dormitory Colleges vs. Commuting Colleges

Admissions can be operated without regard either to standards of quality or to wide service to people. Regardless of the institution's ideas about what it would like its admissions standards to be, if it has dormitories for students it cannot afford to have the dormitories vacant. If the dormitories are new, they were probably built with borrowed money, and the students' fees are going to pay off the mortgage. If the dormitories are old, they are probably already paid for; but the students' fees are going to be used to operate the institution. Either way, an empty bed means anticipated revenue which will not be realized. One way to solve the admissions-standards dilemma, then, is to solve it so that as many beds as possible will be filled. This solution simply forgets all about what was said above concerning diversity, comparability, serving the uneducated, etc., and merely solves the statistical problem of admitting enough people (hopefully, but not necessarily, of the best possible caliber) to be sure that, even allowing for those who are admitted and do not come, all the beds are most likely to be full. The college is operated like a hotel. The procedure for doing this is available in a recent article in the Journal of Educational Measurement (Hills and Klock, 1965) and, as far as I can tell, it or a similar procedure with the same purpose is the way the University System colleges with dormitories are currently setting their admissions standards. Standards go up and down as the relationship between the number of dormitory spaces and the number of applications fluctuates.

Colleges which do not have dormitories can use the same procedure for setting admissions standards if they are willing to say how many students they want to serve or will be prepared to serve. Usually in our System the colleges without dormitories are either junior colleges or have recently been converted from junior to four-year colleges. They tend to want to serve all the educational functions of society which are not being served by someone else. This means that they hesitate to turn anyone away. They want to offer any course that seems needed, from Sanskrit to spelling, but they also want to provide what is called "college-parallel" work, i.e., courses which are the equivalent of those which would be offered to the student during his freshman and sophomore years if he went to the University of Georgia, Georgia State College, or Georgia Institute of Technology instead of going to the commuter college in his own community.

The nondormitory colleges in our state supply one end of the continuum of diversity, but they also contribute to the supply at the other end through selection into curricula after admission.

This later selection is not without difficulty; it is reported to me that the quickest way to kill the enrollment in a class in one of these institutions is to label it as "terminal," i.e., not transferable to a four-year college. At first blush it seems odd that students who are not well-prepared or motivated for the work which leads to a four-year degree would shy away from courses just because those courses are not transferable to a four-year degree program. But remember, the propaganda does not stress that the pot of gold lies waiting for everyone who takes even terminal courses in college. Each student wants to keep open the possibility that he might indeed be a late bloomer and make the grade to a bachelor's degree regardless of his poor preparation and disinterest in hard intellectual effort. That degree would assure him of hundreds of thousands of dollars of additional income, if he is to believe what he reads in the newspapers and in the advertisements of the loan companies.

"Higher" Education vs. Salvage

Another dimension, or perhaps another way to look at the same "diversity" dimension, is whether the program offered by a college is primarily aimed at trying to do something for unfortunate people who do not have very good secondary education and want to improve themselves, or whether the college's program is primarily aimed at trying to produce graduates who can compete in scholarship or in the market with the graduates of any other colleges anywhere. Unfortunately, it is commonly the case that the products of colleges aimed at salvaging the academically disadvantaged make their careers as faculty members of the kind of college from which they graduated. Thus is engendered a vicious cycle. The college does the best it can in four years with the students who come to it. Its graduates tend to return to teach in their alma mater or in a similar college. Not very well trained themselves by the standards common at most colleges, they produce new generations in their own image. Certainly we should do something for the academically disadvantaged. Rejecting them from our doors will not help them. But accepting them and pretending that what they will be capable of upon graduation is comparable in quality to that expected of graduates of selective colleges is an unsatisfactory solution, too. Diversity has destroyed comparability, and I am back trying to help the industrialist understand that a college diploma is not a college diploma, and there is no such thing as the equivalent of two years of college.

What Could be Done--Ideas for Consideration

I am not able to offer a dramatic solution to the problem of diversity and comparability which includes immediate acceptability by all concerned. However, I have some ideas which might be worth thinking about--they might at least have, as they say, heuristic value.

If an organized system of higher education had explicit realistic goals, it would not seem far-fetched for its various units to have varied assignments which, if well met by each unit, would insure that the system's goals would also be met. In another context, the concept is that of division of labor. If the assignments of each unit were well understood, defined, and clarified to the public as well as to other units and to the faculty within each unit, it would not be inconceivable that the units whose mission was similar could have admissions standards that were similar. Those whose mission was the production of scholars could have one set of standards. Those whose mission was the production of technicians could have another. Those whose mission was to produce whatever it is that we aim to produce with two years of terminal education could have another set of admissions standards. Those who had the task of salvaging what could be salvaged would have another set, and so on through all the necessary divisions involved in accomplishment of whatever task the System is given. Some units might have more than one mission, and, accordingly, more than one program and more than one set of admission standards. But this would be made very explicit to all concerned -- students, faculty, administration, the scholarly community, and the entire public. Simply put, I'm suggesting for debate the possibility of handling the problem through organization and honest description of the organization, substituting knowledge for what seems to me to be carefully nurtured ignorance or even deception.

What are the problems with this approach? Two seem pre-eminent. First, there is prestige. As education is now organized, it is prestigious to be associated with selective admissions, high standards, advanced degrees, etc. The salvage operation is the lowest level of Kenneth Eble's (1962) academic limbo. My suggestion would put the salvage operation on the same status level as the training of the scholar. Both are necessary parts of the mission which public higher education is to accomplish. It will not be easy to make this change in the minds of the public, or of educators. It may be impossible.

The second problem is autonomy. In my proposal faculty members would be able to choose their own goals only by choice of the unit of the system in which they chose to be employed. There would not even be much of the illusion that a faculty could decide to change the direction of an institution without consideration of anything other than its corporate navel. Colleges like to think of themselves as autonomous even when their autonomy is so slight (largely due to financial considerations) as to be unobservable. My proposal would eliminate even the illusion of institutional autonomy, except as an institution might seek to modify the entire system. The problem of autonomy might be even more difficult to handle than the problem of prestige--but I don't have a word for something that is even harder than impossible. Still, there must be a solution somehow just because it is so futile to continue to operate as we are. I can only hope that my discussion has indeed served to stimulate investigation or discovery of other solutions.

What have I said in this discussion? First, higher education is torn by different motivations. This is perhaps seen most clearly in considering admissions policies in the institutions of a state in which all public higher education is coordinated by one governing body. The higher education system tries to serve diverse interests with a system of labels for achievement which implies a comparability which does not and cannot exist. The problem can be sidestepped by basing admissions on such mundane considerations as paying off the mortgages on the dormitories, but the problem does not go away because it is ignored. Solutions can be proposed from a theoretical vantage point, but their practical implementation is obstructed by the illusions of prestige and autonomy which exist in the minds of the men involved. What is more difficult for a man to do than to surrender his illusions?

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AN OVERVIEW

Leo F. Redfern
University of Massachusetts

For at least 104 years, since the Morrill Act of 1862 provided encouragement for establishing the land grant colleges, the federal government has granted funds for the support of higher education. The Morrill Act, and similar land-grant legislation such as the Hatch Act, Smith-Lever Act, and Bankhead-Jones Act, also established the now familiar patterns of support through outright grants, categorical aid, and matching fund requirements.

Except for incidental participation by institutions in certain federal economic recovery programs during the Depression, such as the National Youth Administration and Public Works Administration projects, the federal role in aiding colleges and universities was largely confined to the land-grant system until the 1940's. After World War II a noticeable increase in federal funds for higher education occurred. The so-called "GI Bill" established a national scholarship pattern for veterans interested in pursuing college training. In addition, there arose significant federal contributions in the form of research grants and contracts -- notably in categorical fields related more or less to national defense goals. Problems that emerged from the impact of this federal assistance included the development of imbalance in academic programs between federally-aided disciplines and non-federally-aided disciplines, and the problem of inadequate recognition of overhead allowances required for contract services.

National defense and military preparedness continued to provide the stimulus for further extension of federal assistance in the form of the National Defense Education Act of 1958, enacted in response to the Soviet success with Sputnik. The NDEA contained provisions for financial aid to students -- a form of federal support that had tended to lapse after the "GI Bulge." Undoubtedly, such a paramount concern as national security was required to prod federal action in an area replete with private and parochial interests, states rights adherents, and defenders of well-established traditions. Such concern over federal penetration into higher education has served to prevent outright dominance by the federal government over colleges and universities. Using the avenue of approach offered by national security did have the result, however, of restricting developing forms of federal aid to subject-matter fields that could be identified rather closely with defense needs and thus created the imbalance problem for institutions of higher learning.

In some respects the Higher Education Facilities Act of 1963 can be regarded as a major turning-point in higher education - federal government relations. This act established a rather broad commitment by the national government to aid in the critical expansion of physical facilities needed by institutions, both public and private. This legislation was followed rather quickly by the Higher Education Act of 1965 which removed most of the categorical restrictions in the Higher Education Facilities Act and provided, also, for aid in a number of broad areas of education operations, including expansion of the NDEA student-aid program.

It is fair to say, I believe, that the federal government is now into the mainstream of higher education over its hipboots and one problem is to see that it does not muddy the waters.

Let me mention three potential threats of federal impact to which those who are engaged in evaluating and advising for institutional executives should be particularly alert. One is the apparent impetus of federal agencies to gather control over institutional operations into federal hands. The second is a federal tendency to take unilateral actions and make decisions with no real consultation with institutions directly involved and vitally affected. And the third is an emerging thrust of certain federal agencies or legislation to deal with commercial and profit-making enterprises for purposes of carrying out alleged education projects.

This first possible danger, federal control, is specifically prohibited, I know, by law in a section added to practically every contemporary act aiding education. It is added almost automatically, as the separability clause is perfunctorily added to bills by legislative draftsmen. Yet intent and action may show discrepancies. One concrete piece of evidence, to my mind, was the effort in the Presidential budget for Fiscal Year 1967 to divert most of the established land-grant funds, authorized as broad institutional grants "for as long as this nation shall endure," and to allocate support of the programs on a project basis whereby proposals are selected and approved by federal authorities for specific project grants or contracts. Question: How can intelligent institutional planning be based upon unpredictable "soft-money" funds allocated spasmodically on a project basis by decision of federal agents who are removed from the context of institutional development?

As to the second possible danger, unilateral federal action is noticeable at present in federal implementation of the Higher Education Facilities Act. The Office of Education issues pink-colored directives in implementing this program without consulting, to my knowledge, either the state commissions established for this program or the institutions. These bulletins direct changes to be made in State Plans or in policies under which state commissions operate. In some instances these directives have been retroactive in effect and thus caused concern to the state commissions. It is interesting to note that such directives tell the state commissions to make the required decisions -- and thus be first in line to receive the brunt of any institutional ire that may be engendered.

The third area of caution in regard to federal impact lies in the unsettling feeling that commercial considerations are gaining entree into education, partly through growing federal assistance programs. I am not referring to the development of distinguished firms, such as Xerox or Time-Life, moving or buying into the education supplies and equipment field. Rather, concern is focused on such examples as provided in the federal Technical Services Act which was stated to be an attempt to bring the land-grant concept of agricultural extension to bear upon the problems of business and industry. Just as the colleges of agriculture and their extension agents assisted the struggling farmers to become prosperous and productive, so too, it was claimed that similar measures should be provided to aid the struggling businessman and industrialist.

Yet there are indications that the United States Commerce Department may have sought to promote commercial research and development firms and commercial consulting firms to engage actively in this area of education service and some of these were led, apparently, to seek to become the designated state agencies required under the law. Furthermore, in the field of water research an effort is now underway, it seems, to by-pass the State Water Resource Centers created under previous federal law and located largely in educational institutions. Effort is being made to allow federal agencies to grant funds to commercial firms for work in this area without any reference to state plans being developed by the State Water Resource Centers. Therefore, funds that could be used as broad supporting grants to help implement the coordinated state programs, which include in many instances projects for interstate cooperative action, might now be diverted by federal authorities to commercial projects which could duplicate, overlap, or possibly conflict with federally-aided state plans.

Another source of concern regarding commercial penetration into education policies and programs allegedly occurred in passage of the Higher Education Act of 1965 when lobbying was apparently undertaken to structure certain provisions of the law, especially those pertaining to support of audio-visual facilities. Now that higher education is becoming "big business" in terms of size and expenditures, it may be that the danger of imbalance formerly created by relating support to defense needs may be replaced by relating support to those educational areas engendering the most active commercial lobbying efforts.

It is important to note some of the challenges which federal aid may pose for the institutional research specialist.

1. If an institution does not have a staff assigned responsibility for federal liaison work, then Institutional Research may be the only institution-wide office that could keep track of federal aid

programs and keep officers and faculty informed as to pending legislation, terms and conditions of existing law, and whom to contact and when in regard to federal aid. In some institutions without special staff, this responsibility may be exercised by a graduate dean or coordinator of research, with institutional research providing a supplemental source of assistance.

2. Institutional research could certainly evaluate the extent, if any, of imbalance in institutional programs caused by the various forms of federal assistance received.

3. Working with fiscal officers of the institution, institutional research specialists might assess the adequacy of federal allowances for indirect costs (sometimes called "overhead") in various projects conducted by the institutions. Institutions should be aware of the extent, if any, by which contract services in programs such as the War on Poverty, AID overseas projects, and Peace Corp training programs, are regarded by federal officials as commercial negotiations without concern for aiding institutions to build the intrastructure necessary to support institutional participation. A federal agency responsible for a particular program probably does not have the same concern as an institution that participation by the institution in the program can lead to depletion of institutional "capital." Indicative of this federal attitude is the failure to implement the Bell Report which specifically directed attention to this problem in connection with AID contracts.

4. Without question, institutional research offices should be geared to providing necessary basic data required in completing federal application forms. The growing need for data in complying with federal programs, such as enrollment, capacity/use ratio of facilities, faculty-student ratios and the like, makes a general file or data bank a necessity for any institution aspiring to active participation in federal aid programs.

5. Finally, I believe, some institutional research office, somewhere, ought to devote its attention to the "compliance costs," as they might be called, of institutional participation in federal programs. I don't mean the indirect costs in contract services referred to earlier, but the costs of pulling together, compiling and inserting data in federal forms and the subsequent reports, forms, and audits required in receipt of federal aid. Perhaps economists and statisticians can be enticed into participating with institutional research specialists in this endeavor. I have the impression, for example, that under Title VI Category A and Category B grants of the Higher Education Act of 1965, some institutions will have to invest as much in preparing and complying with federal procedural requirements as they may receive in dollar aid as assignable under a number of state plans.

It has been suggested that the impact of federal aid is of sufficient importance to warrant the Association for Institutional Research giving consideration to the establishment of a committee or commission to study this matter at some length, with the view of not only carefully identifying the problem areas but of recommending remedial actions. I would concur with this suggestion as well as another one to the effect that if the purpose of federal aid is to strengthen institutions of higher education, rather than to aid in carrying out the missions of various federal agencies, then consideration should be given to the use of "block grants" to institutions, as is done in Britain and Canada.

These suggestions require thorough study and evaluation, of course. But such evaluation and study are the very essence of institutional research. By applying itself to major issues, institutional research will retain the vitality and vigor that have marked it as an interesting and exciting area of academic life.

NATIONAL POLITICS AND HIGHER EDUCATION

Humphrey Doermann
Harvard College

Sometime this past year -- although the statistics have not yet been assembled to prove it or disprove it -- the amount of federal money flowing into American colleges, universities, and their associated research centers, became the largest single source of funds for American higher education. Before then, the state governments, taken together, were the largest single source. If federal spending in education continues to grow at its present pace, it will more than double during the next five years. Under these circumstances, federal policy towards colleges and universities will clearly have a major effect on what these institutions become, or fail to become, in the next twenty-five years.

What I have just stated seems obvious enough today so that it sounds trite. Ten years ago, most of us, I suspect, would not have predicted as great a federal involvement in higher education, although some of us would have favored it.

There are three topics of discussion in this paper:

1. The broadest possible -- hence thoroughly incomplete -- outline of the main changes since World War II in the relationship between the federal government and institutions of American higher education.
2. Two of the most pressing problems which these changes bring: the increasing dependence on a single new source of funds, and the need to find ways for our institutions to participate sensibly in the formation of federal policy at sufficiently early stages.
3. What we might do about these problems. The approach I suggest will not be new or particularly startling: our institutions must become more politically aware, and in closer touch with federal policy makers, particularly in the Congress.

Main Changes

One major change in the relationship between the federal government and colleges and universities is in academic science. In the late 'Thirties and early 'Forties the federal government was faced with the problem of mobilizing and expanding the research capacity of academic science. At the beginning of World War II this mobilization was largely accomplished by leaving research workers in their own laboratories, rather than by trying to create a complete new network of government facilities. The atom bomb project, forerunner of today's "big science" projects, was the major exception to this decentralized pattern.

Under this scheme, government research contracts were awarded to public and private universities on the basis of how well and how fast the work seemed likely to be done. As much control as possible was left to the research investigators, and patents emerging from the work were usually left in their hands. Scientists, outside of government, were called upon to evaluate the research proposals and the fitness of the investigators (more than 2,000 non-government panelists served in 1963, for example).

From what one can tell from Congressional testimony and from reports of the National Academy of Science and the National Science Foundation, few people seriously question that the basic system of project research has provided remarkably good research results and has left university laboratories far better off than if the initial decision had been to move research science totally under the federal control. A recent report from the National Academy of Science gives the project research system a large share of credit for the leadership which the United States has achieved in science since World War II. It is also clear, however, that one side effect of the project research system is that it tends to strengthen colleges and universities which are already strong in science, and to provide little or no help to the weak.

The second major change in the relationship between the federal government and colleges and universities is the new government participation in the adjustment from an era in which relatively few students (by present standards) attended relatively low-cost colleges (by present standards), to the present era of high enrollments and high costs. The federal government is involved in direct student aid as never before.

By 1947, more than half of the nation's college students were enrolled under the G.I. Bill of Rights. This level of federal support quickly receded after the college-bound Veteran population passed through. The level of federal support to college and university students remained low until the late 1950's, when the government, under the National Defense Education Act of 1958, began to give noticeable assistance of two major kinds: loans to undergraduates and fellowships to graduate students. This dual pattern of assistance has grown in size and complexity, but the main characteristics are the same. In 1965, federal loans to undergraduates made up roughly two thirds of all loans to undergraduates, and provided also the standard by which other lending agencies appraised the relative attractiveness or unattractiveness of their own lending terms. Federal fellowships for graduate study, meanwhile, provided not only a huge source of assistance for students but an incentive for universities to expand their graduate schools, and financial incentive for students to choose graduate study, usually in the sciences, instead of some other field, perhaps law or medicine. Imbalances still exist in some of these student assistance programs; it would be remarkable in a period of such rapid growth if there were not problems. But the total record in federal support to students seems to be a good one, as the total record seems to have been in project research. The major side effect one may note in the university distribution of graduate fellowships is also the one seen in project research: the strong are strengthened and the weak are not.

The most recent major development, and perhaps the most interesting since it requires a new (and politically more complicated) approach to federal-university relations, is the increased federal interest in strengthening specific colleges and universities, or particular subdivisions of them. If the nation needs more first-rate universities, colleges, and research centers -- and if the older methods of fund distribution were failing to meet this need -- then new approaches aimed at institutional development seemed to become necessary. The older approaches were relatively impersonal, even if their side effects were not. But before the federal government can award institutional development money to specific colleges or universities, the federal government must decide which ones are worthy of special attention and by what standards. This recognition that specific institutions need federal help in their development seems appropriate from an educational viewpoint, but it can become political dynamite once the federal programs grow large.

If this too-rapid review of change in the federal involvement in science research, in student aid, and in institutional development has any merit, what does it mean for us now? I think it means that we are all suddenly much more involved in national politics whether we like it or not, and whether we choose to make our response active or passive.

Problems

Two current problems, among many which could be chosen, help to illustrate the point.

The first problem is that posed for an institution as it becomes more and more dependent on a single, new, large source of funds. It is not new for private colleges to be concerned with enrollment volume, tuition, scholarships, and the complex ways in which they all must be considered together. It is not new for publicly-controlled colleges to be actively involved in dealings with state and municipal legislative bodies. But it is relatively new that both need to be actively concerned with what happens in Washington.

For example, in President Johnson's budget message to the Congress in January, the appropriation for National Defense Education Act student loans for the coming year was cut back from

$190 million dollars to $40 million, presumably as part of a general effort to trim federal expenditures at home to compensate for the rising cost of war abroad. It was argued then that the federally guaranteed and subsidized private loan program would prove an immediate and adequate substitute. Without going into the full details here, it seemed clear to many college admission and financial aid offices that at the best this move would cause a year of some hardship and uncertainty to needy students, and at worst it could seriously interrupt the education of many. This particular cutback, carried out with this particular timing and without advance planning, may have made sense for what it could do for totals in the federal budget; but as an educational policy decision it was a bad one. The uproar has passed away, now that the President has agreed to restore most of the funds originally cut away and now that the Congress seems likely to restore the full amount. Because the outcome was not disastrous, one might argue that all remains well with the world. A more realistic view seems to be that our institutions remain vulnerable to unpredictable gaps in federal support, particularly vulnerable in areas where we have geared our activities to the assumption that federal support will continue undiminished. And one should note in this particular example that it is unusual for an educational issue to arise where virtually every kind of college can agree, and where the effects of ill-considered action can be so easily demonstrated.

A more frequent kind of example is that presented by the apparent concentration of federal research money in a few universities and in a few geographical areas of the United States. Clearly it is in the nation's interest that there be more good colleges and universities, and that they not be concentrated in a few regions. What kind of federal policy makes sense to help achieve this growth and dispersion? Speaking for myself only, I think that a greatly enlarged institutional development makes the most sense...this in addition to a relatively unchanged project research mechanism. Probably a variety of mechanisms for awarding federal institutional development money will be necessary, even if untidy. None of the major ways now in use -- central-agency awards, state commission decisions, or *ad hoc* panels -- can alone and successfully make all of the decisions which would have to be made. New ways must also be found.

Conclusion

My conclusion is neither startling nor will it, by itself, solve all of our new problems. The trends and problems just discussed seem to show that, like it or not, most of our institutions are increasingly affected by the national politics of education. University and college representatives need to talk more frequently and productively with legislators, congressmen, and senators *before* the legislation which affects higher education takes final shape. We should somehow find a way to be heard at times *other* than those when our own oxen have been gored, or seem about to be.

Contact with legislators *only* through representatives of large education associations does not seem to be enough. Contact by *every* institution with *every* legislator *all* the time outside of these associations is too much. But somewhere in between there is need for more productive contact, and without it we run all the dangers of living with bad policy because we didn't know soon enough what might have been better or because we didn't make it known. This broadening of our activity seems essential if we are to live increasingly within the limits imposed on us by public accountability for public funds on the one hand and by the need to retain predominantly independent control and independent purpose on the other.

A SINGLE DATA SYSTEM FOR LONG RANGE PLANNING AND SHORT RANGE MANAGEMENT

Harry S. Allen
University of Nebraska

> "The real thing in this world is not so much where we stand, but where we are moving."
> ---Oliver Wendell Holmes

The University of Nebraska is the fastest growing institution of higher learning in its region. Between 1963 and 1965, enrollment increased 32 percent from 11,463 to 15,129 students measured on a head count basis in both years. Since the University does not report extension students in its enrollment data, these are essentially the same as full time equivalent students. On a numerical basis, only the University of Missouri, exceeded the growth rate of Nebraska; and the Missouri growth included its branches in Kansas City, St. Louis, and Rolla.

The growth at the University of Nebraska has taken place within a highly decentralized institution. As one of the early members of the Association of American Universities, it has always had a strong faculty senate and deep traditions of departmental independence. Against this general backdrop, the introduction of a central planning function has been relatively slow, but it is no longer possible for the University to continue many of its historic processes.

For this reason, we have been trying to approach the problem of developing a data system from the point of view of making it comprehensive in its usefulness and avoiding, if possible, the necessity of introducing a whole new series of data requirements for different aspects of the planning and management problems of the University.

Winston Churchill was once quoted as having said, "First we mold our buildings and then they mold us." The comment seems to underline the basic problem in all educational planning--to make sure that the objectives are clearly defined, the program accurately stated so that plans, buildings, and administrative devices become not ends in themselves or "molders" of the institution, but rather are molded by the institutional purpose. To this end a systems approach to preparing the planning and operational problems of the college or university is useful. In talking to this problem, Ryans (1965) summed up the matter this way: "Long range educational planning must employ the systems approach and must not only scrutinize each of the myriad components or details involved in instruction, but also see them as a coordinated, interlocking and interacting process."

It is in this general direction that the University of Nebraska is moving--the development of a single data system which is useful in both the estimate of long range staff and facilities requirements and in the short range problems of management and budgeting. We are fully aware, of course, of many of the problems involved in using a common body of data for both long range and immediate purposes, and perhaps these should be discussed more fully. The intent of this paper, however, is merely to describe the procedures being developed at our University and the promises that it seems to offer to improved planning.

Components of the System

There are four principal elements involved in the system:

1. Activities
2. Performers of activities
3. Information records
4. Policy planning parameters

Each of these four elements is present in any analysis of both the short range operational needs on a campus and the longer range planning problems. An analysis of the activities being performed is essential to the annual budget, to the matter of class schedules, staff requirements, and supporting services. In the process of planning, in order to make an estimate of the number of people required to perform these activities, certain prior estimates or assumptions must first be arrived at with respect to the amount of work load, however measured, that will have to be carried; and such estimates or assumptions are, in turn, obviously dependent on the recorded information available.

For purposes of illustrating the developing system, we will deal with instruction as a single activity and trace from a common set of information the components involved in planning for both immediate and long range needs.

Course Data as the Basic Unit in Building-Planning

Course registration data rather than student credit-hour data are the basic "activity file" in our procedure. This is not to say that we do not also consider separately identifiable components of need such as research space, special purpose areas, etc., but we start with an analysis of course registrations to (a) project classroom requirements, (b) laboratory needs, and (c) staffing requirements, which in turn generate the requirement for faculty office spaces and related facilities.

We start with a historic analysis of registrations in each of the courses, classified according to the college of origin of the student registrant. On a historic basis we establish a relationship between head-count enrollment in each of the several university colleges and the individual courses taught. The purpose of such an analysis is simply to refine projections of course registrations by knowing from which part of the university enrollment the students come into the course. Thus, we can project what growth in the College of Engineering means to enrollments in Freshmen English.

Course registrations have been related not only to the college of origin of the registrant but to the level of students in the class. Our data processing now routinely produces two basic documents in this regard--one is a semester analysis of college of origin of student enrollments, and the other is the level of student registrations in each course.

The relationship of course registrations to these two factors (college of origin and level of student registration) is then applied to estimated university enrollment levels, to establish estimated course registration. The projection is made on the basis of a series of individual indices for each course taught--not a single overall index. The result is shown in Table I. The steps in the computer program to establish these projections are outlined in Appendix I.[1]

The second step in the procedure is to identify the policy-planning parameters as shown in Table 2, these, of course, are variable. They are originally developed within each teaching department, reviewed within the Institutional Research office and with the Vice Chancellor for Academic Affairs, and adjusted after consultation. One series of planning parameters deals with (a) the size of the lecture classes, laboratories, and discussion sections, and (b) the credit-hours and clock-hours involved in each course. A second set of planning parameters outlines desired faculty load. Application of the planning parameters to the projected number of registrants will produce an estimated number of individual sections or classes required to offer the course at a given enrollment level.

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[1] The computer programming was developed by Professor Don Nelson, Director of the University of Nebraska Computer Center. At present we are using an IBM 7040 computer but will shortly install an IBM 360/60 series computer.

TABLE 1. Estimated Registrations in Departmental Courses at Target Enrollments of 18,000 Students, 20,000 Students and 25,000 Students, by Course Department J

	Course Registrations			
Course Number	Actual 1964-65	18,000-Student Enrollment Projection	20,000-Student Enrollment Projection	25,000-Student Enrollment Projection
70	24	33	37	46
70C	16	22	26	31
75	15	21	24	29
75C	16	23	28	34
81	126	176	195	241
82	46	64	71	88
128	8	10	13	15
157	7	9	11	13
159	10	13	17	19
171	17	23	27	33
176	13	17	21	25
177	7	9	12	13
181	10	14	15	19
184C	12	16	19	23
191	7	9	11	13
192	31	42	49	59
199	16	22	24	30

Source: Taylor, Lieberfeld, and Heldman, Inc., Report to the University of Nebraska, Volume II, 1966.

TABLE 2. Policy Planning Assumptions Regarding Class Size and Clock Hours of Meeting Per Week at Target Enrollments of 18,000 Students, 20,000 Students and 25,000 Students, by Course and Type of Meeting for Department J

Course Number	Course Level	Credit Hours	Lecture, Classroom Class Size	Lecture, Classroom Clock Hours Per Week	Recitation, Seminar Class Size	Recitation, Seminar Clock Hours Per Week	Laboratory, Workshop Class Size	Laboratory, Workshop Clock Hours Per Week
70	1	2	40	1	--	--	20	3
70C	1	2	40	3	--	--	--	--
75	1	2	40	1	--	--	20	3
75C	1	2	--	--	--	--	40	3
81	1	2	40	2	--	--	20	2
82	1	3	40	2	--	--	20	3
128	2	3	30	2	--	--	20	3
157	2	3	30	3	--	--	20	2
159	2	2	30	2	--	--	20	2
171	2	3	30	3	--	--	20	2
176	2	3	30	3	--	--	20	2
177	2	3	30	2	--	--	20	2
181	2	3	30	3	--	--	20	2
184C	2	3	30	3	--	--	--	--
191	2	4	30	3	--	--	20	2
192	2	3	30	3	--	--	--	--
199	2	1	--	--	--	--	--	--

Source: Taylor, Lieberfeld, and Heldman, Inc., Report to the University of Nebraska, Volume II, 1966.

For example, if 80 registrations were projected for a given course and the planning-policy was to teach this class in sections of no more than 40 students, we would need to have two sections of this class. If this class were taught for three clock-hours per week, simple computation would indicate that for this particular course the University must provide a 40-student-station classroom available for six clock-hours. Assuming that all classrooms would be used for 34 hours per week of actual use this particular course would generate the need for .18 of a classroom.

The aggregate of all such decimals or portions of classrooms of given sizes then produces the total number of classrooms for either (a) the university as a whole, (b) departments if this is the point of analysis, or (c) a group of departments, or more than one such group, for which the university plans to group into a building project (Table 3).

The projected number of course registrants also generates the need for teaching laboratories of given student-station capacity, and the required number is computed on the same basis.

The projected course registrations also produce the student credit-hour estimate. The estimate can then be used in applying teaching policies with respect to the desired ratio between student credit-hours and a FTE faculty member to determine the estimated faculty needs for a given planning period. This in turn translates into the number of faculty offices needed as well as the numbers of supporting secretarial and clerical staff associated with faculty, etc.

TABLE 3. Distribution of Instructional Workload in Classroom-type Facilities by Class Size and Projection of Classroom-type Meeting Rooms Required at Target Enrollments of 18,000 Students, 20,000 Students and 25,000 Students, Department J

Class Size Range	18,000 Student Enrollment		20,000 Student Enrollment		25,000 Student Enrollment	
	Clock Hours Per Week[a]	Meeting Rooms Required[b]	Clock Hours Per Week[a]	Meeting Rooms Required[b]	Clock Hours Per Week[a]	Meeting Rooms Required[b]
480 +	--	--	--	--	--	--
360-479	--	--	--	--	--	--
240-359	--	--	--	--	--	--
120-239	--	--	--	--	--	--
90-119	--	--	--	--	--	--
60-89	--	--	6	.2	--	--
50-59	--	--	3	.1	--	--
40-49	--	--	9	.3	12	.3
30-39	15	.4	22	.6	12	.3
20-29	16	.5	50	1.5	15	.4
5-19	21	.6	139	4.1	21	.6
Under 4	--	--	--	--	--	--
Total	52	1.5	229	6.6	60	1.7

N.B. Items may not add to totals due to rounding.

[a] Includes all clock-hours generated as lecture, classroom seminar recitation, discussion meetings.

[b] At 34.3 hours per week; i.e., 70 percent utilization, 49-hour teaching week.
City Campus: 7:30 A.M. - 4:30 P.M., Monday-Friday. 7:30 A.M. - 11:30 A.M., Saturday.
East Campus: 8:30 A.M. - 5:00 P.M., Monday-Friday. 8:00 A.M. - 12:00 Noon, Saturday.

Source: Taylor, Lieberfeld, and Heldman, Inc., Report to the University of Nebraska, Volume II, 1966.

The value of the computerization of the system is the immediate demonstration we can make of the impact of proposed faculty loading on department staffing requirements as well as on long range building needs. We are finding, for example, that as departments begin to translate preferred teaching situations of both class sizes and teaching loads into actual staff-need projections, significant upward adjustments take place in planned loads (Table 4).

The technique of using course registration data as a basis for projection of building needs is not a unique one. Probably one of the most comprehensive systems of building estimating using this methodology was developed over a several-year period by the Colorado Association of State Institutions of Higher Learning (1965).

Their manual contains an extensive set of formulas and instructions for aggregating course data and translating the information into square footage requirements. The manual established the following general guideline:

> "Work loads may be expressed in terms of student credit-hours, full time equivalent enrollment or head count number of course registrations.....the head count number of course registrants is the preferred basis for expressing instructional work loads if the data is directly available."

TABLE 4. Analysis of Alternate Measures of Instructional Workload, Fall 1964 and Target Enrollments of 18,000 Students, 20,000 Students and 25,000 Students
Department J

Item	Fall 1964	18,000-Student Enrollment	20,000-Student Enrollment	25,000-Student Enrollment
Student Credit Hours	911	1246	1436	1746
Lower Division	532	742	833	1026
Upper Division	379	504	603	720
Graduate	---	---	---	---
Student Registrations	381	523	600	731
Lower Division	243	339	381	469
Upper Division	138	184	219	262
Graduate	---	---	---	---
Clock Hours Per Week	99	116	120	140
Lower Division	55	67	69	86
Upper Division	44	49	51	54
Graduate	--	--	--	--
Full-time Equivalent Students	57	78	90	109
Lower Division	33	46	52	64
Upper Division	24	32	38	45
Graduate	--	--	--	--
Full-time Equivalent Faculty	4.2	5.8	6.7	8.1
Lower Division	2.2	3.1	3.5	4.3
Upper Division	2.0	2.7	3.2	3.8
Graduate	---	---	---	---
Students Per Faculty Member	13.6	13.4	13.4	13.5
Student Credit Hours Per Faculty Member	217	215	214	216
Student Registrations Per Faculty Member	91	90	90	90
Clock Hours Per Week Per Faculty Member	23.6	20.0	17.9	17.3

Source: Taylor, Lieberfeld, and Heldman, Inc., Report to the University of Nebraska, Volume II, 1966.

The procedure in Colorado recognized the differential growth in course registrations but related these differentials primarily to student levels expressed in terms of lower division, upper division, and graduate student credit-hours. The trend as to course registrants was then projected on the basis of estimated changes in these broad areas of student credit-hour production.

For long range projection purposes, the method has proven satisfactory, though considerable refinement must inevitably take place in the process. Dober (1963) in his volume on campus planning summarizes a number of similar approaches all of which basically use the concept of projection of space requirements on the basis of assumed student loads as they relate to full-time equivalencies.

In what is being developed at the University of Nebraska, the essential addition is a data system which refines the projection of course registrations in such a way as to make it useful for both building-planning and operational purposes.

For purposes of long range building programming, we start therefore with (1) activities--basically the course registrations; (2) from this we compute the needed number of performers of activities, both faculty and supporting staff; (3) we maintain a file of policy-planning parameters, generally dealing with class size and teaching load; and we also have a (4) basic set of information records in two periodic reports, the course registration by college of origin and the course registration by level of student.

Course Data for Short Range Management

How is this projection used as a basis for short run management purposes? At the moment there is a basic use, an assessment by the registrar's office of the number of sections which will have to be provided for the next registration period.

Student credit-hour data as a measure of faculty load is very useful in making general estimates of institutional or even departmental requirements. On an operating basis, however, the use of the student credit-hour data has less meaning, since deans and department heads must staff for actual student registrations and not for an average statistic. It is in this context that individual course registration projections take on value. In the University of Nebraska, class size has been and continues to be a matter of departmental determination. Until the development of course-projection data, the individual departments would set ceilings on class sizes on an intentive basis and this often forced the registrar's office to try literally to put "two gallons of students" into a one-gallon jug of sections. Yet there was not a set of data which would graphically illustrate the problem to the departments in specific terms.

The course-projection data enables our registrar's office to meet with the departments and deans and show them specifically the result of arbitrary limits on section sizes; it allows clear demonstration of the need for either (a) additional sections which may generate additional staff needs, or (b) increases in the sizes of the existing sections. The course-projections are now being used within the university for the first time. While not yet universally accepted, at least in one of the colleges with the university decisions were made for next fall which seem to portend a much smoother intake of students and better provision of staff in the Fall semester of 1966 than was true previously.

Because all segments of the university do not grow at equal rates--indeed some segments do not increase at all--the analysis of course growth as it relates to the uneven growth of the various colleges provides a much clearer view of staffing requirements than either estimates of enrollment on a college-by-college level or projections of student credit-hours by subject-matter fields of study.

Admittedly, in the short run there are a number of variables which make the projection system less meaningful, though in our judgment not so many as to render it useless as a tool to assist in the planning of course scheduling and year-to-year faculty and staff needs.

For the coming fall semester, we have applied the ratios of course enrollment in each course, both by level of student registration and by college of origin, to the estimated total enrollments for the university. From this we have projected the estimated number of course registrants for each course in the university catalogue. These initial projections have then been modified on the basis of (a) course rearrangement in specific departments, and (b) data which has been tabulated in the registrar's office about courses which in the past have been closed early because of lack of space. This backlog factor has been added to the projected number of registrants in some courses. The projected course registrations resulting from the planning system have been used administratively in projecting staff requirements and in providing class space.

One by-product of the system was that the projection resulted in an advance assessment of faculty needs which directed earlier recruitment of staff in selected teaching departments than would otherwise have been the case for the Fall semester of 1966.

The projection is also the starting point for our biennial budget planning. This is not to say that all phases of the budget are to be projected on the basis of a formula or a statistical average. There are many subjective considerations which always must be considered.

Despite these limitations, the University administration feels that the single set of data has general application for immediate budget planning as well as long range estimating of building requirements. The application of the data system to the latter has been made in the case of three specific building projects, (1) a new chemistry building, (2) a women's physical education facility, and (3) a combination classroom-office building designed to house some of the departments of the College of Arts and Sciences.

In the three widely different kinds of circumstances, the planning system resulted in building programs which were well received within the departments and developed building programming-specifications which one architect indicated saved some six to eight months of time which formerly would have been used in discussing with the operating departments such specifics as room sizes, number of classrooms, and other details.

The use of the same data for planning Fall 1965 scheduling and staff recruitment has been primarily in the College of Arts and Sciences, and the general consensus seems to be that it represents a major step forward from what has heretofore been a rather random and decentralized method of projecting the extent of our annual staffing problems.

There are major refinements which we must make in this system, but in general our initial experience seems to indicate that the single data system is applicable to both short and long range projections requirements.

Use of Course Data for Room Scheduling

Since actual teaching spaces are not provided for student credit-hours but for students, the data on course projections can become an aid in a still further area of immediate management, the actual scheduling of space. The use of the data permits prior estimates of section sizes and numbers considerably sooner than former procedures used within the University. The scheduling office thus knows well in advance, with a rather substantial degree of accuracy, the way rooms of various sizes will have to be scheduled for the next registration period. As the University moves into the computer scheduling of classes, the course registration data will be a basic component of the data system.

REFERENCES

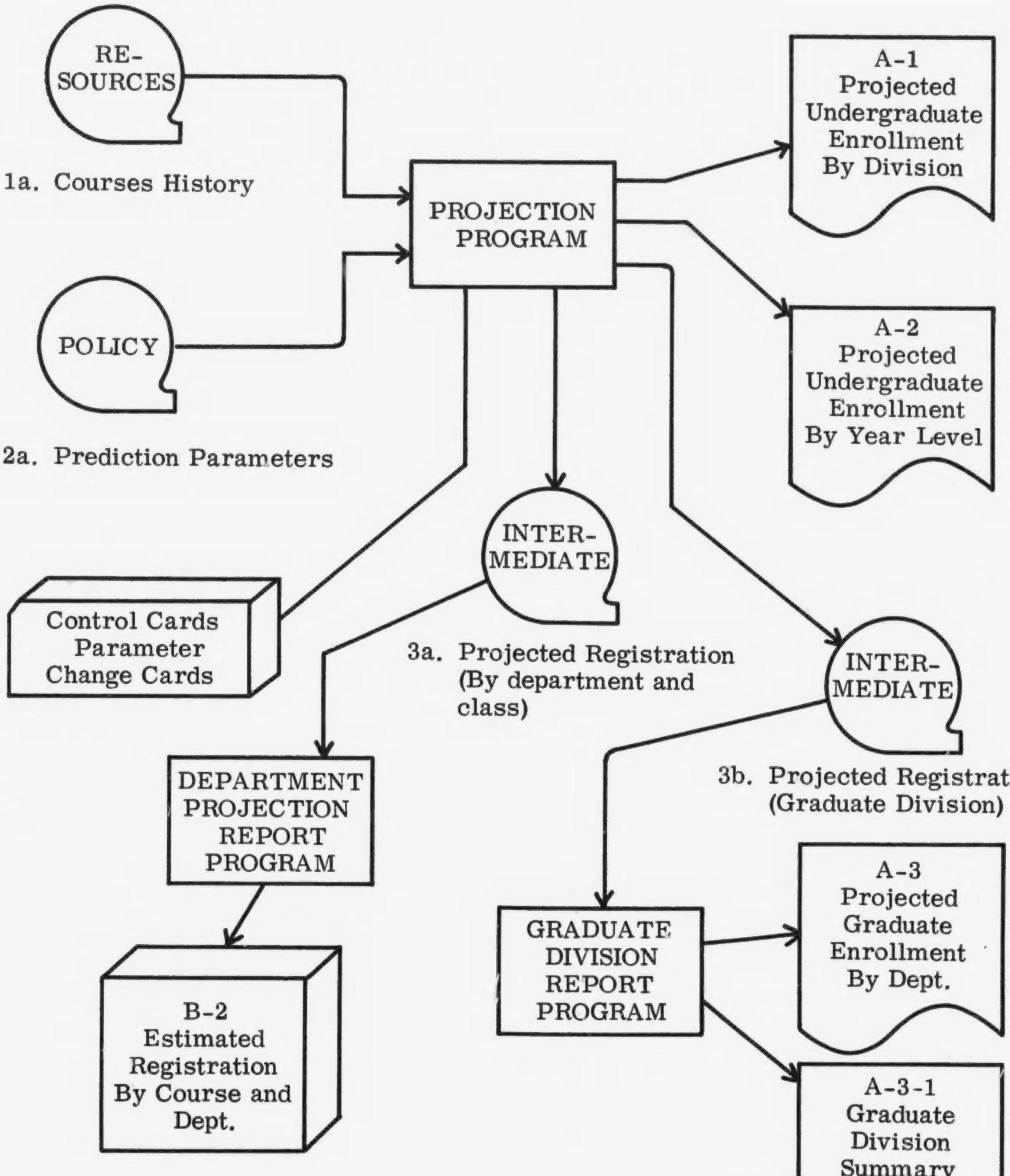
Dober, Richard P. Campus Planning, Reinhold Publishing Corporation, Cambridge, Massachusetts, 1963, p. 73ff.

Ryans, David G. Long Range Planning in Higher Education, Western Interstate Commission for Higher Education, Boulder, Colorado. April, 1965.

Guideline Procedures and Criteria for Campus Development and Capital Outlay Planning. Association of State Institutions of Higher Education in Colorado, Denver, 1965.

Appendix I

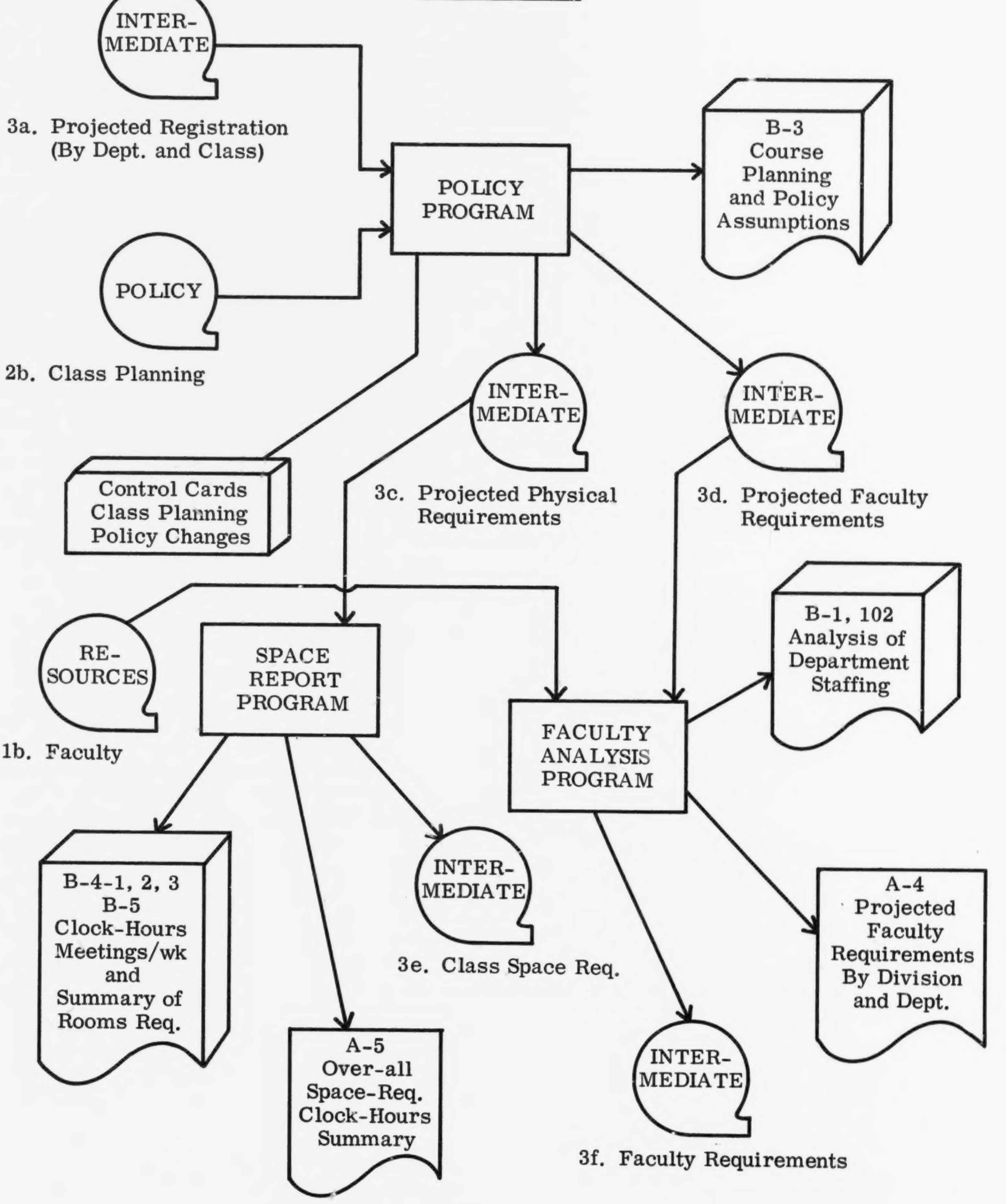
PROJECTION PROGRAM


RE-SOURCES
1a. Courses History
POLICY
2a. Prediction Parameters
PROJECTION PROGRAM
A-1 Projected Undergraduate Enrollment By Division
A-2 Projected Undergraduate Enrollment By Year Level
INTER-MEDIATE
3a. Projected Registration (By department and class)
Control Cards Parameter Change Cards
INTER-MEDIATE
3b. Projected Registration (Graduate Division)
DEPARTMENT PROJECTION REPORT PROGRAM
B-2 Estimated Registration By Course and Dept.
GRADUATE DIVISION REPORT PROGRAM
A-3 Projected Graduate Enrollment By Dept.
A-3-1 Graduate Division Summary By Division

NOTE: Report writing programs could be incorporated into the projection program. The order of the reports printed is a function of how the projection parameters are entered (i.e. which level; class; department; or college).

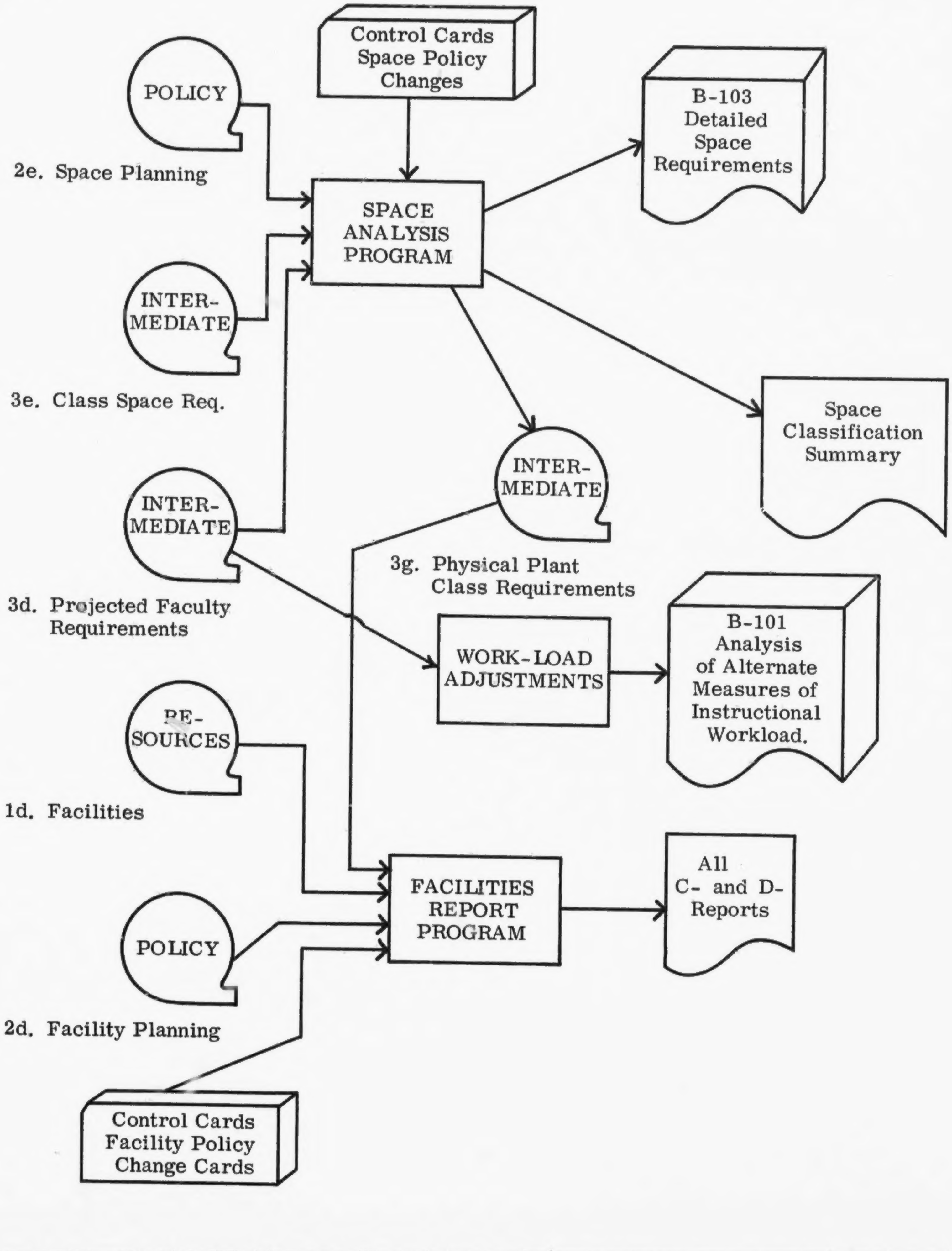
Appendix I

CLASS POLICY


INTER-
MEDIATE
3a. Projected Registration (By Dept. and Class)
POLICY
2b. Class Planning
POLICY PROGRAM
B-3 Course Planning and Policy Assumptions
Control Cards Class Planning Policy Changes
INTER-
MEDIATE
3c. Projected Physical Requirements
INTER-
MEDIATE
3d. Projected Faculty Requirements
RE-
SOURCES
1b. Faculty
SPACE REPORT PROGRAM
FACULTY ANALYSIS PROGRAM
B-1, 102 Analysis of Department Staffing
B-4-1, 2, 3 B-5 Clock-Hours Meetings/wk and Summary of Rooms Req.
A-5 Over-all Space-Req. Clock-Hours Summary
INTER-
MEDIATE
3e. Class Space Req.
A-4 Projected Faculty Requirements By Division and Dept.
INTER-
MEDIATE
3f. Faculty Requirements

Appendix I

SPACE POLICY PROGRAMS


Control Cards
Space Policy
Changes
POLICY
2e. Space Planning
B-103
Detailed
Space
Requirements
SPACE
ANALYSIS
PROGRAM
INTER-
MEDIATE
3e. Class Space Req.
Space
Classification
Summary
INTER-
MEDIATE
INTER-
MEDIATE
3g. Physical Plant
Class Requirements
3d. Projected Faculty
Requirements
WORK-LOAD
ADJUSTMENTS
B-101
Analysis
of Alternate
Measures of
Instructional
Workload.
RE-
SOURCES
1d. Facilities
FACILITIES
REPORT
PROGRAM
All
C- and D-
Reports
POLICY
2d. Facility Planning
Control Cards
Facility Policy
Change Cards

FORMS AND PROCEDURES USED FOR IMPLEMENTING ACADEMIC PERSONNEL ACTIONS AT INDIANA UNIVERSITY: THEIR RELATION TO ACADEMIC INPUT

Louis A. D'Amico
Indiana University

The addition of new administrative units within an institutional organization, growth in institutional size, the increase in the variety of institutional functions, and the constant lag between the development of an efficient system and a status quo situation are factors which can impede the efficient operation of colleges and universities. Also contributing to the "state of the art" is the turnover in key academic administrative positions. Nevertheless, college and university officials recognize the need to systematize their operations and are working in that direction. Officials at institutions which do not utilize a systems approach to management will continue to find it difficult to operate consistently, efficiently, and completely.

Problem

Preceding and immediately following the appointment of new academic staff at Indiana University, new faculty members formerly were beleaguered with requests for information by different units of the University. Many of the items of information requested were similar in nature, and this, as I can attest, was a considerable bother to the new entrant. But more important, it was felt that the process of implementing personnel actions, whether those of new or existing academic staff, needed to be examined and improved. The Vice-President for Academic Affairs and Dean of Faculties directed the Bureau of Institutional Research to survey the existing forms and procedures used in implementing academic personnel actions and to recommend the changes deemed necessary for improving them.

Procedure

To obtain data on the adequacy of the forms and procedures used to implement academic input at Indiana University, the Bureau of Institutional Research developed a survey instrument to be used in interviews with the responsible officials in the major academic administrative units of the University. The interview form was so structured that the respondents (deans, departmental chairmen, or their assistants) could relate their views on adequacy of: (a) academic personnel-form format and contents; and (b) procedures. The interviewees were requested to provide this information for new appointments. In addition, the interview form contained a section pertaining to the following topics: honoraria, promotion, resignation, leave of absence, faculty history, and so on. The interview form was also used to obtain information from various other University officials, including: the Secretary of the Board of Trustees; the Director of the Archives; the Editor of the News Bureau; the Director of the Budget; the Assistant Controller, and the Research Contracts Accountant. In all, besides the six officers listed above, information was obtained by interview from 12 schools or departments. The length of time required for an interview ranged from one to 2-3/4 hours.

In order to obtain an indication of the practices of comparable institutions, requests for information on forms and procedures used to implement personnel actions were sent to IRCE (Big Ten plus University of Chicago) and a selected small number of non-IRCE institutions. Responses and sample copies of forms were obtained from all 16 institutions included in the survey.

Results

To put the results in proper perspective, it should be mentioned that many of the forms and procedures used at Indiana University were developed to meet a need of the times. Letters from sister institutions indicate this to be a common genesis of forms. As institutions grew in size and complexity, very rarely were forms and data items integrated to a point where the needs of the numerous units of a university were obtained by a minimum number of forms. An examination of the forms obtained from sister institutions and those used at Indiana University showed that these forms were developed by people with varying levels of sophistication in form design and contents. Although there is little evidence for this generalization, it does appear, however, that once a form has been developed and used for any length of time, it becomes an inherent part of the unit which developed it. Thus increases in institutional size, complexity, and function may generate additional forms and procedures but may not necessarily do away with old forms and procedures. Also agitating for form and procedure retainment is the fact that generally subsidiary administrative personnel are less likely to recommend and initiate changes.

There was no unanimity of response by the various officials interviewed as to adequacy of (a) form format and contents and (b) procedures pertaining to the implementation of academic personnel actions. The majority of officials were receptive to the idea of improving the forms and the procedures. These officials made some very positive and valuable comments. A small minority, however, were negative toward changes and wanted to retain the status quo. In fairness, it must be stated that some of those who did not want changes had some valuable comments to make on the format of forms as well as on individual items.

Based on the information obtained by interviews, the following recommendations were made:

1. With regard to personal and professional data on new applicants, it was proposed that the University adopt one form which would meet the data needs of the various administrative units of the University (see exhibit A). The proposed form would replace three existing personnel data forms. All prospects for academic appointments would be required to complete two copies of the form before campus visits. The Bureau of Institutional Research would assume responsibility for systematizing total faculty information and for generating needed reports on faculty to the various administrative units of the University and to outside agencies.

2. To expedite personnel action, it was proposed that the University adopt one form to replace the following existing forms: (a) Recommendation for Academic Appointment; (b) Notice of Appointment-Academic Personnel; and (c) Executive Actions (see exhibit B). Departmental Chairmen would initiate a multi-carbon copy of this form at the time the decision was made to hire an individual. The new form would be routed to the pertinent administrative officials for approval. When the multi-copy form had been approved by these officials, and the budget director had checked to determine that funds were available to hire an individual on a given account, carbons would then be distributed to the appropriate officials.

Not included in the proposed Academic Personnel Action form is information on tenure conditions. It was recommended that the departmental chairman assume the responsibility for informing the prospective faculty member of the tenure conditions which he and the Dean of Faculties had agreed to offer. The candidate for a tenure position would be requested to sign the tenure statement, which in turn would be countersigned by the Dean of the Faculties at the time the individual accepted employment at Indiana University.

3. As for other forms (Honoraria, Non-Citizen Oath or Affirmation, Physical Examination, Annual Faculty Report), modifications were suggested in most cases. Major changes in the format and procedures for the honoraria form were suggested. This was also true for the Student Appointment form. However, no changes were suggested for the Non-Citizen Oath or Affirmation form. Minor revisions in content and format were suggested for the physical examination and Annual Faculty Report forms.

4. To implement the expeditious flow of the new personal and professional characteristics information form and the new Academic Personnel Action form a flow diagram was developed (see exhibit C). Routing of these forms through the appropriate officials would alert them to the requirements and inform them of impending action.

A summary of the advantages of the proposed system includes the following:

1. Eliminates duplication of effort by applicant and many administrative units of the University.

2. Provides simultaneous processing to speed up the appointment process.

3. Provides hard-copy of the appointment process for all interested offices.

4. Eliminates paper (see exhibits A and B).

5. Provides additional information on faculty heretofore not collected.

6. Relieves the Dean of Faculties' Office of a considerable number of lesser forms.

7. Provides a crossed-loop system which insures that information will be collected on all faculty.

8. Meets the data collection and retrieval requirement of Midwestern Universities Consortium on International Activities and the Indiana University Foundation (see below).

9. Provides ready access to all items contained in the file through data processing.

10. Permits computer production forms for offices which require information about faculty (i.e., Dean of the Faculties, News Bureau).

11. Eliminates the practice of xeroxing or retyping many of the forms in many offices.

Some Observations

It was apparent from the comments received from officials in sister institutions that there is widespread interest in developing systems which would enable colleges and universities to process personnel actions speedily, efficiently, and completely. Because more than 80 per cent of those who responded to our request for information on this topic indicated some dissatisfaction with their forms and procedures and a desire for information on the outcome of our endeavor, we felt prompted to submit this topic for consideration to the AIR Forum. It was felt that our experience could be shared at the AIR Forum with survey participants and other institutions. Too, an airing of our experience could elicit some objective and critical comments which would serve to point out the flaws in our proposals and thus make for improvements.

An additional impetus for developing a systems approach to Academic Personnel Actions has been the requirements of the Midwestern Universities Consortium on International Activities and the Indiana University Foundation. Their need for better and more accessible current data on faculty has led to the development of a faculty research file which consists of a tape record of faculty vita and research interests. The faculty research file not only serves the needs of the administration but will serve the faculty as well. Through the use of this file the administration will be able to inform appropriate faculty members of potential research support in their areas of interest and of potential overseas assignments.

Information for this file pertains to all faculty. To obtain information on all faculty members, a computer print-out containing data available from existing records was supplied to faculty members. They were asked to check the print-out data for accuracy and to complete all the pertinent items which were blank on the print-out. With periodic up-dating and with the completion of this form by new appointees, we feel that we will have a comprehensive and usable faculty research file.

Conclusion

The proposed new forms and procedures for implementing academic personnel actions will enable the University to develop a more workable and more efficient system for processing academic input. Further, with the initiation of the MUCIA and Indiana University Foundation faculty research file, the University will be able to have current and complete data on the research interests and professional training and experience of its professional personnel. Some of the benefits that will be gained from the revised forms and procedures are:

1. The faculty will not be required to complete a number of questionnaires requiring similar information. With the new form, faculty members can no longer ask--"how many times do they want to know my name?" The new personal and experience form will meet the data needs of all units of the University.

2. The new personal and experience form will also eliminate gaps in data. Although the forms used by the various units of the University to collect information on faculty were very similar with regard to items of data requested, they nevertheless did not give comprehensive coverage to the data needs of the University.

3. In conjunction with the MUCIA and Foundation faculty research file project, the University will be able to exercise better control in the processing and manipulation of faculty data. What this amounts to is that better faculty data input will result in significantly better faculty data output.

4. Undoubtedly a savings in the costs for clerical services will be effected. Although heretofore the time involved in the mailing and editing of forms by the various units was duplicated by clerical personnel in each of the requesting units, with the new form the clerical costs for mailing and handling the forms will be reduced substantially.

The new procedure will lighten the paper burden in the Dean of Faculties' Office. In addition to reducing the paper volume, the new procedure will enable the University to process academic personnel actions more expeditiously and efficiently.

Exhibit A
Indiana University
Faculty and Professional Staff Information

1. Name: ______________________________
Last First Middle

2. Social Security Number: ___ - ___ - ___ 3. Sex: Male_____ Female_____

4. Address: ______________________________
Street City State

5. Phone Number: __________ __________
Office Home

6. Place of Birth: ______________________________
City (State (or Country)

7. Date of Birth: ______________________________
Month Year

8. Marital Status: Married ____ Single ____ Other ____ ______________
Please specify

9. Citizenship: U.S.A.-by birth ___ U.S.A.-by naturalization ___ Non-citizen ___

10. Year of birth of children: _____ _____ _____ _____ _____ _____

11. Education

A. Secondary School: ______________________________
Name and Address Year of graduation

B. Undergraduate Institution(s)

Name and State Location	Dates Attended		Major	Minor	Degree(s)	Year Degree Granted
	From	To				

C. Graduate and Professional Schools

Name and State Location	Dates Attended		Major	Minor	Degree(s)	Year Degree Granted*
	From	To				

*If you are currently working on an advanced degree please indicate year you expect to receive your degree.

12. Academic Honors (include awards, medals, honorary fellowships, etc.)

Honor	Awarded By	Year

13. Employment: Please provide in chronological order starting with your present position, the professional positions you have held for the past 15 years.

Position Title	Name and Address of Employer	Dates of Employment		Annual Salary
		From	To	

14. Foreign Language: Please provide your proficiency in foreign languages you list.

Language	Lecture	Converse	Interpret	Read	Write	Translate

15. Memberships and positions in honorary, learned and professional organizations.

Name of Organization	Dates of Membership	Position Held

16. Military Service Status

(a) Have you served in the Armed Services of the U. S.? Yes _____ No _____

If yes, are you a member of the reserves? Yes _____ No _____

If yes, what is your present reserve status classification?

Ready ____ Standby ____ National Guard ____ Retired ____

17. Are you related by blood or marriage to any member of the Board of Trustees of Indiana University? Yes ____ No ____

If yes, indicate relationship____

18. References: Please provide the names and addresses of three or more persons from whom information concerning you may be obtained.

____

____

____

____

19. Publications: Please provide bibliographic references, including co-authors, title, etc. of all journal, magazine articles and books which you have published. Also provide a brief description of any scientific discoveries, inventions and original designs which you have worked on. If more space is needed, attach additional pages.

Exhibit B
Indiana University
Notice of Academic Personnel Action

Name______________________________ Date______________

Address (Local, if established)______________________________

Social Security Number ___ ___ ___ - ___ ___ - ___ ___ ___ ___

Department______________________ School______________________

A. Nature of Action and Conditions:

1. Action Requested: ___Initial Appointment ___Reappointment ___Change in Status
   ___Change in Rank ___Termination ___Other (Specify)________
2. Beginning Date (Day, Month and Year)______________________
3. Ending Date ______________________
4. Salary $______________ ______________________
5. Title and Rank______________________
6. Pay Base ___5 Month ___9 Month ___10 Month ___12 Month ___Other (Specify)__________
7. Position Number(s) in Budget______________________
8. Account Number(s) from which salary will be paid______________________
9. Full-Time Equivalency: ---Full-Time If Part-Time, Indicate % of Full-Timeness______
10. Add any explanation of appointment action needed.

B. Approvals:

TITLE	DATE	TITLE	DATE
Department Chairman	________	Dean of the Faculties	________
Appropriate Director	________	President	________
Academic Dean or Administrative Officer	________	Budget Officer	________

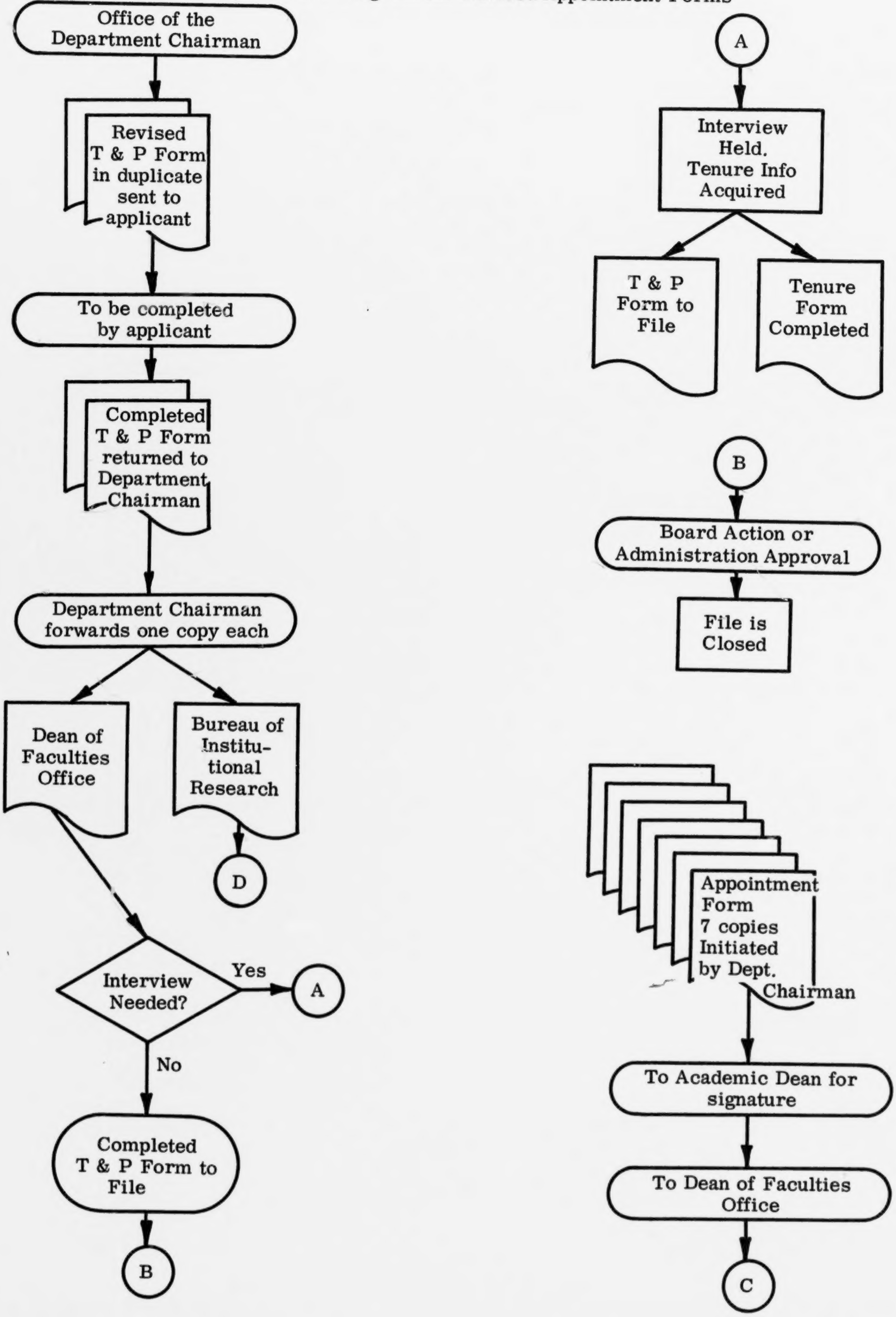
Routing:

Originates from department, to Academic Dean if appropriate.
To Dean of the Faculties, one copy detached and sent to Budget Officer, then to payroll.
To Office of the President.
To Bureau of Institutional Research for bursting and distribution to receiving officers.

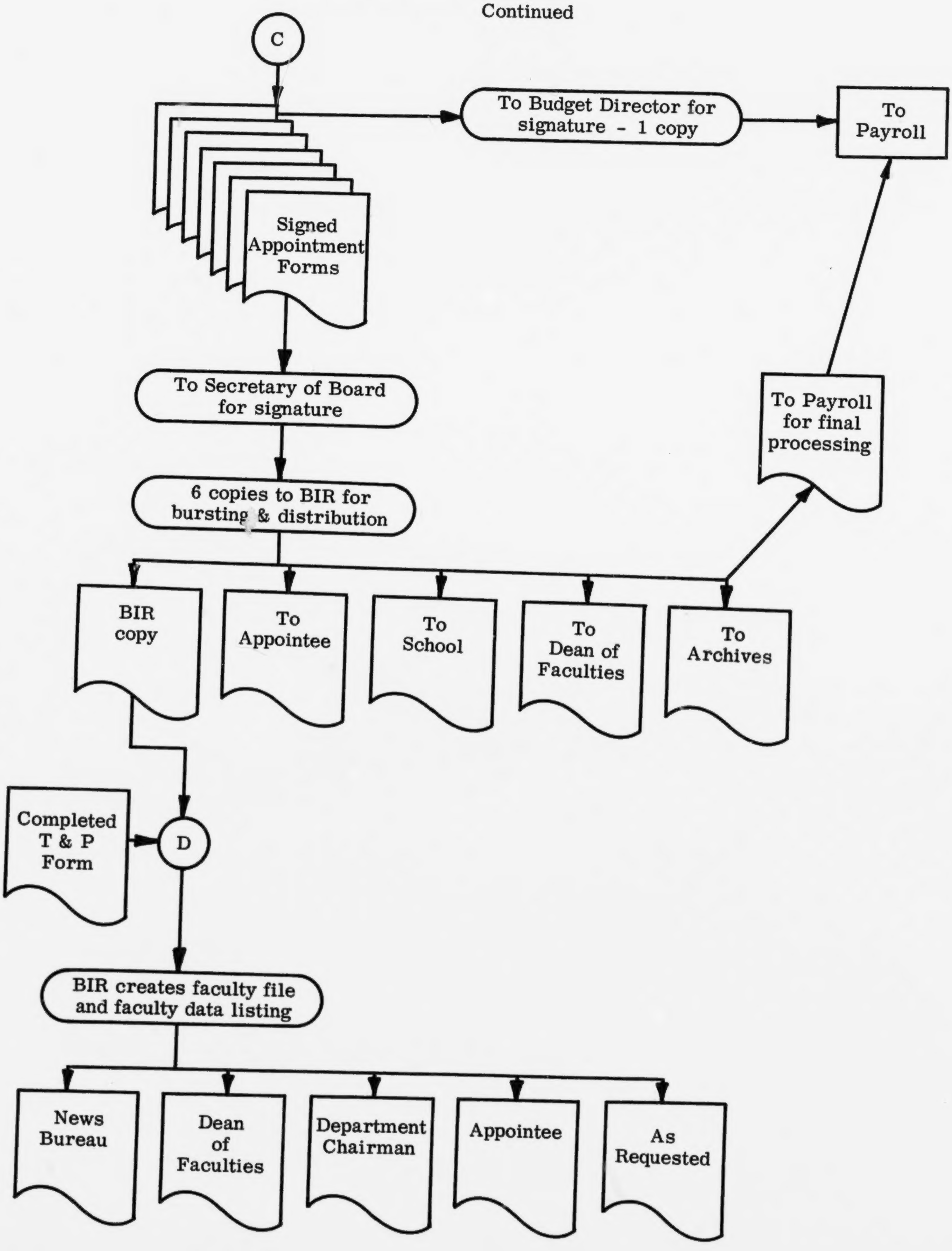
Receiving Offices:

Department
School/Division
Dean of the Faculties
President
Bureau of Institutional Research
Payroll
Appointee

Exhibit C
Flow Diagram for Revised Appointment Forms


Office of the Department Chairman
Revised T & P Form in duplicate sent to applicant
To be completed by applicant
Completed T & P Form returned to Department Chairman
Department Chairman forwards one copy each
Dean of Faculties Office
Bureau of Institutional Research
D
Interview Needed?
Yes
A
No
Completed T & P Form to File
B
A
Interview Held. Tenure Info Acquired
T & P Form to File
Tenure Form Completed
B
Board Action or Administration Approval
File is Closed
Appointment Form 7 copies Initiated by Dept. Chairman
To Academic Dean for signature
To Dean of Faculties Office
C

Continued


C
To Budget Director for signature - 1 copy
To Payroll
Signed Appointment Forms
To Secretary of Board for signature
To Payroll for final processing
6 copies to BIR for bursting & distribution
BIR copy
To Appointee
To School
To Dean of Faculties
To Archives
Completed T & P Form
D
BIR creates faculty file and faculty data listing
News Bureau
Dean of Faculties
Department Chairman
Appointee
As Requested

A MINI-MAX DISTANCE STUDY IN SOLVING CAMPUS PARKING PROBLEMS

Keith W. Trowbridge
Bowling Green State University

Universities grow and growth creates demands of various sorts--demands for new buildings, for more faculty, more staff, and, not least of all, for more parking facilities. The automobile has brought the student, faculty member, and administrator faster and perhaps more safely to his destination, but once there, and about to be abandoned by its occupants, the automobile requires approximately the same amount of space as a seminar room for twenty. Most parents sending their son or daughter to a university with a car do not realize that even with ideal facilities this student's car will require more space on a campus than to house their son or daughter. In a space occupied by twenty automobiles, 300 students could be given instruction.

The organization of campus traffic and parking must not only encourage the procurement and maintenance of personnel but also take into consideration the need to blend in with the campus's aesthetic surroundings. In the past many students, faculty, and alumni looked upon a college campus consisting of an environment both aerial and open with stately old halls of stone and brick, fine trees, shaded benches, and wide, pleasant walks. Such ivy-clad surroundings were removed from the hubub of the workaday world. Today if the pattern of activity prevalent on many campuses and the pressure of the automobile continues, the campus of the future might be a vast parking lot dotted with buildings, trees and shrubs planted in conspicuous spots so as not to block traffic or reduce the number of parking spaces. The cars are, it would seem, indispensable and here to park.

Student Automobiles

In the Fall of 1965, Bowling Green State University had a student population of 9,863 which registered 2,488 automobiles with the police department. Freshmen had the fewest cars, 11.3 per cent, the percentage increasing each class year with sophomores having 19 per cent, juniors 30 per cent, and 44.6 per cent of the seniors registering cars.

As might be expected, a greater number of male students own automobiles. Men had a registration percentage of 36 per cent and 10 per cent of the women registered.

In comparing grade-point averages by class of those students owning cars with the all-campus grade-point average of students in their class, it was found that in each class (see Table 1) students who registered cars had a lower grade-point average than students who did not have cars registered on campus.

TABLE 1. GRADE POINT AVERAGE AND CAR REGISTRATION

	Freshmen	Sophomores	Juniors	Seniors
With Cars	2.048	2.213	2.464	2.692
Class Grade Average	2.240	2.267	2.514	2.704

The statistical significance of this grade-point average, however, may be highly biased on a men-women basis. We are doing further studies on grade-point averages of students driving cars on campus and will have information on how significant, if any, the grade-point average is.

Proposed System of Parking Assignment

The present system of parking assignments has led to an overassignment of parking lots to the extent that many are unhappy with the present method of assignment. The assigning of people to parking lots and having them walk to their offices is basically a transportation problem in which people are moving from parking lot to destination. In solving transportation problems a methematical technique called linear programming is used to help solve the most efficient method of allocating resources. This technique will be applied to the University parking problem in an effort to minimize walking distances.

In order to use linear programming to help solve the campus parking program, a chart of distances was drawn up (see Table 2). In this table (called a matrix) the distance in feet is measured from each parking lot to each possible destination. The parking lots are listed across the top of the chart with their capacities which have been increased by 25 per cent to allow for the planned overassignment factor. The buildings are listed in the left hand column with the number of employees in each building. A fictitious building called Britney Hall was added and assigned a number of employees, representing the difference between the total spaces and the total number of employees. The slack variable which is represented by Britney Hall in this matrix is used to balance employees with spaces and permit a solution (see Table 3).

TABLE 2. DISTANCE FROM PARKING LOT TO DESTINATION IN FEET

		Lot #	4-B	4-A	1	11	18	3	15-B	15-A	10	2	16
Building	Employees	Spcs.	149	120	348	233	193	198	158	76	83	425	63
Ad. Building	165		2,850	2,850	2,050	1,000	1,200	1,200	300	300	1,550	1,800	650
Williams	66		2,350	2,400	1,550	600	800	1,100	750	750	1,400	1,450	600
Union	60		2,350	2,400	1,500	800	600	900	800	950	1,100	1,200	400
Overman Hall	48		2,200	2,400	1,250	1,300	300	800	1,400	1,600	750	550	800
Hayes Hall	76		2,100	2,200	1,150	950	450	950	1,200	1,350	1,000	900	700
Moseley Hall	26		2,050	2,100	1,200	500	850	1.250	1,000	1,050	1,400	1,350	750
Univ. Hall	69		2,050	2,050	1,300	250	1,100	1,400	1,000	1,000	1,600	1,650	900
Hanna Hall	43		2,050	2,050	1,450	200	1,400	1,650	1,100	950	1,900	1,900	1,150
South Hall	41		2,250	2,200	1,650	350	1,450	1,650	1,000	800	1,950	2,000	1,100
Maint. Bldg.	11		1,800	1,800	1,100	250	1,200	1,600	1,300	1,250	1,750	1,650	1,100
Commons	51		1,450	1,400	1,000	450	1,600	2,000	1,700	1,600	2,100	1,950	1,550
Mem. Hall	41		1,200	1,350	400	900	1,300	1,800	1,900	1,900	1,800	1,500	1,500
Fine Arts	16		500	650	600	1,400	2,000	2,500	2,500	2,450	2,500	2,200	2,200
Harshman	75		550	350	1,500	2,250	3,000	3,500	3,450	3,300	3,450	3,000	3,200
Founders	49		2,700	2,700	2,050	850	1,500	1,550	650	350	1,900	2,050	1,000
McDonald	56		2,900	3,050	1,900	1,750	400	300	1,350	1,650	200	600	750
Shatzel	5		2,750	2,800	1,950	1,000	1,000	1,000	300	450	1,400	1,600	500
Prout	9		2,350	2,500	1,450	1,000	400	750	950	1,150	900	950	400
Sororities	22		2,650	2,750	1,700	1,100	550	650	700	950	950	1,100	100
Kohl Hall	15		1,700	1,650	1,250	300	1,600	2,000	1,550	1,400	2,150	2,050	1,500
Rodgers	14		1,250	1,150	1,050	800	1,900	2,350	2,000	1,900	2,450	2,250	1,850
Fraternities	38		700	550	950	1,350	2,250	2,750	2,550	2,450	2,750	2,500	2,350
Conklin	11		350	350	900	1,600	2,350	2,850	2,750	2,700	2,800	2,450	2,500
Library	25		2,400	2,400	1,750	550	1,300	1,450	750	600	1,750	1,850	900
Home Ec.	12		2,550	2,550	1,850	700	1,250	1,350	600	450	1,700	1,850	850
Music Bldg.	34		2,750	2,750	2,050	850	1,350	1,350	450	250	1,700	1,900	800
Power Plant	5		3,250	3,300	2,450	1,450	1,250	1,050	250	550	1,450	1,800	750
Johnston Hosp	17		2,650	2,750	1,800	1,000	750	800	500	750	1,150	1,350	150
Men's Gym	13		1,800	1,900	950	650	850	1,300	1,300	1,350	1,400	1,250	950
Women's Gym	16		1,900	2,050	950	950	650	1,150	1,400	1,550	1,150	950	900
Britney Hall	917		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

TABLE 3. ASSIGNMENT OF PARKING SPACES BY LINEAR PROGRAMMING WITH NO LIMITATION

		Lot #	4-B	4-A	1	11	18	3	15-B	15-A	10	2	16
Building	Employees	Spaces	149	120	348	233	193	198	158	76	83	425	63
Ad. Bldg.	165		-	-	-	-	-	-	158	-	-	-	7
Williams	66		-	-	-	-	66	-	-	-	-	-	-
Union	60		-	-	-	-	42	8	-	-	-	-	10
Overman Hall	48		-	-	-	-	-	-	-	-	-	48	-
Hayes Hall	76		-	-	-	-	76	-	-	-	-	-	-
Moseley Hall	26		-	-	-	26	-	-	-	-	-	-	-
Univ. Hall	69		-	-	-	69	-	-	-	-	-	-	-
Hanna Hall	43		-	-	-	43	-	-	-	-	-	-	-
South Hall	41		-	-	-	41	-	-	-	-	-	-	-
Maint. Bldg.	11		-	-	-	11	-	-	-	-	-	-	-
Commons	51		-	-	51	-	-	-	-	-	-	-	-
Memorial Hall	41		-	-	41	-	-	-	-	-	-	-	-
Fine Arts	16		16	-	-	-	-	-	-	-	-	-	-
Harshman	75		-	75	-	-	-	-	-	-	-	-	-
Founders	49		-	-	-	-	-	-	-	49	-	-	-
McDonald	56		-	-	-	-	-	-	-	-	56	-	-
Shatzel	5		-	-	-	-	-	5	-	-	-	-	-
Prout	9		-	-	-	-	9	-	-	-	-	-	-
Sororities	22		-	-	-	-	-	-	-	-	-	-	22
Kohl Hall	15		-	-	-	15	-	-	-	-	-	-	-
Rodgers	14		-	-	14	-	-	-	-	-	-	-	-
Fraternities	38		-	38	-	-	-	-	-	-	-	-	-
Conklin	11		11	-	-	-	-	-	-	-	-	-	-
Library	25		-	-	-	25	-	-	-	-	-	-	-
Home Ec.	12		-	-	-	3	-	9	-	-	-	-	-
Music Bldg.	34		-	-	-	-	-	-	-	27	-	-	7
Power Plant	5		-	-	-	-	-	5	-	-	-	-	-
Johnston Hosp.	17		-	-	-	-	-	-	-	-	-	-	17
Men's Gym	13		-	-	13	-	-	-	-	-	-	-	-
Women's Gym	16		-	-	-	-	-	-	-	-	-	16	-
Britney Hall	917		122	7	229	-	-	171	-	-	27	361	-

It is possible to solve a matrix of a linear programming by hand calculation, but one of this size would take weeks of man hours. The IBM Corporation has a transportation model for linear programming in its Common Library of programs (#10.1.005) which was applied by use of the 1620 computer at the Bowling Green State University's Computer Center. The results show how the program assigned employees to parking lots. Everyone was assigned a parking lot but not necessarily the one closest to the building where they worked. Some people walked farther so that a greater proportion of people could travel a lesser distance.

It was found that the distance travelled by all people averaged 458.95 feet per person. The total distance has been minimized and if this was a straight transportation problem for a transfer of goods it might well be the optimum answer. However, in this problem we are dealing with people, and in arriving at our optimum solution we have had some people travel a distance of 1,350 feet. It is felt that 1,000 feet is a maximum distance that should be requested for an employee to travel from parking lot to destination.

The problem was run again with distances over 1,000 feet eliminated from consideration. As a result, the total distance travelled by all people was 524,000 feet. This increase of 5,850 feet (or an average increase of five feet) meant nobody travelled more than 1,000 feet. In order to see how far it would be possible to reduce the maximum distance travelled, another matrix was established with all distances over 800 feet eliminated.

When all distances over 800 feet were eliminated, the grand total distance increased 9,900 feet above the figure when 1,000 feet was used as a maximum. The average distance walked increased from 464 to 472 feet per person.

The 800 foot limitation, however, proved to be too restrictive, consequently a number of persons were required to walk up to 1,000 feet. It can therefore be assumed that the ideal solution lies somewhere between 800 and 1,000 feet maximum walking distance and that the program would have to be run many times to arrive at this figure. For illustrative purposes, we have pursued this far enough to prove that a solution within satisfactory tolerances can be worked out by use of linear programming.

Linear Programming of Parking Compared to Present Parking Assignment Method

In a comparison of the two methods of assigning parking (see Table 4) it was found that by use of linear programming all parking assignments were held to the required 25 per cent overassignment. Lots such as #3 and #2 that were not used at all previously for faculty parking, have now been assigned. Although it was impossible, by use of the present assignment method, to arrive at the total and average distances walked, it is known that by use of linear programming no one in the illustrative example used walked more than 1,000 feet and the average distance walked was 464 feet.

TABLE 4. PRESENT SYSTEM OF PARKING ASSIGNMENT (A)
VS
LINEAR PROGRAMMED ASSIGNMENT (B)

Lot No.	Parking Spaces[1]	Assign. A[2]	Percentage	Assign. B[3]	Percentage
4-B	149	16	10.7	27	18.1
4-A	120	10	8.3	113	94.2
1	348	158	45.4	105	30.2
11	233	384	164.8	233	100.0
18	193	274	142.0	193	100.0
3	198	0	0.0	41	20.7
15-B	158	218	138.0	158	100.0
15-A	76	108	142.1	76	100.0
10	83	54	65.1	56	67.5
2	425	0	0.0	64	15.1
16	63	61	96.8	63	100.0

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[1] Capacity of parking lots increased by 25 per cent to allow for overassignment.
[2] Assignment A--number of cars assigned to each lot for fall of 1965.
[3] Assignment B--number of cars assigned to each lot by use of linear programming, 1,000 feet maximum distance.

It appears from this analysis that linear programming is a successful method to use in assigning parking in order to minimize walking distance. This technique could be applied at any college or university by simply measuring distances, counting parking spaces by lots, counting people by building, and using this information to form a matrix. Proposed new parking lot locations and capacity could be injected into any matrix to see what effect this would have on total and average distances walked. Similarly, the effect of a new building and its parking demand could be outlined and evaluated during the planning stages to see what effect it would have on the total parking program.

The University as a whole received benefits from a well-planned and efficient parking plan. The appearance of the campus, safety of pedestrians, happiness of the faculty, staff, students, and visitors are only a few of the benefits of a well-conceived and efficiently operated parking plan.

UTILIZING ACADEMIC INPUT ON A SYSTEM-WIDE BASIS

Emerson Tully
Florida Board of Regents

Simple and persuasive logic characterizes the generalization that academic input shapes academic productivity, both qualitatively and quantitatively. Yet investigations intended to yield empirical evidence to support this postulate are difficult to design and conduct. Such studies must not only sort out and define predictor variables from a vast array of input components, but must treat with relationships and effects that are quite likely more complexly interwoven than the input factors themselves.

In Florida, as in other states with a single governing board for a group of public universities, another dimension has been added to the research that relates input to the educative process and to educational outcomes. System-wide policies and procedures that affect both the quality of learning and the attainment of educational goals have been established. The need for assessing policies and practices for coordinating a system of state universities is equally as pressing as for appraising the institutional policies under which a single university operates.

To give perspective to the use made of input data in conducting system-wide research, the rapid growth in state-supported higher education in Florida that is now taking place will be sketched in broad outline. Six years ago, Florida had three public universities: Florida State University, the University of Florida, and Florida Agricultural and Mechanical University. Today, the system has five institutions, the University of South Florida and Florida Atlantic University, an upper divisional institution, having opened since 1960. Next year, the University of West Florida, another upper divisional university, and the year following, Florida Technological University will start their beginning classes. By the early 1970's, two additional institutions, which are likely to be essentially urban colleges, are scheduled to begin operation. When these latter two institutions are in existence, Florida will have tripled its system of public universities in about a decade.

The planning for the future operation of these emerging institutions is closely interrelated to the operation and governance of the recently emerged and the older institutions. System-wide research, so urgently called for by coordination of public universities at the state level, is more than a piecing together of research findings generated in each of the universities. System-wide research addresses itself to problems and issues that relate to state-wide coordination. Although on-going programs of institutional research in the universities undergird system operations, research at the state level must also go forward as a component of state-wide planning and coordination.

System-wide research is neither more difficult nor less difficult than research conducted in a single university setting. The same complexities that attend research carried out on the campus also confront the researcher at the system level. Even so, research in the university and system-wide research are not equivalent endeavors, although each may focus on the relationship between input and output factors. The uniqueness of an institution is not primarily at issue in research conducted in a university. In contrast, research at the system level often utilizes data from several institutions for purposes of comparative analyses in an attempt to document institutional differences. Not only does system-wide research aim at comparative analyses, but it may also seek to synthesize institutional data into composite reports. Research at one university seldom has this objective.

This paper has a threefold purpose: (a) to report the issues and considerations cited by research personnel from the state universities and from the staff of the governing board as they set about planning for system-wide research and (b) to describe the genesis and development of a specific investigation conducted on a cooperative basis throughout the several state universities and (c) to relate prior procedural and planning considerations to the research project in its operational phase as an approach to determining if the research was conducted in a manner consistent with the guidelines that were established when the research was projected.

The first of what is certain to be a continuing series of conferences in Florida attended by institutional research officers from the state universities met in November, 1965 to lay the ground work for planning and conducting studies on a cooperative basis. Among the issues listed by the participants in this conference that should be dealt with in planning for system-wide research were the following:

1. Criteria for determining the significance of a proposed research project.
2. Limitations of input data collected at separate institutions when used as a basis for drawing valid inferences about the system of universities.
3. Assistance (financial and personnel) that an individual university is expected to provide and to receive as a participant institution in a system-wide problem of study.
4. Methods of communication among researchers in the various institutions.
5. Responsibilities of the research officers at the state level in inaugurating and implementing system-wide research.
6. Approaches to establishing a productive working relationship among the research staff of the governing board, the institutional research officers in the universities, and other university and governing board officials who have a role to play in research.

From the outset of the conference, the group was in general agreement that institutional research should contribute to validating the role and scope of each of the five universities currently comprising the state system. As a corollary to this initial agreement, the group agreed that the purpose of institutional research projects undertaken cooperatively by the several universities should be to validate the assumptions and expectations contained in the tentative master plan for higher education in Florida.

A proposed system-wide study intended to determine if the enrollment patterns set forth in the master plan as eventualities were actually emerging was discussed, along with other projected studies. General agreement was reached among the conference participants that a study of enrollment trends throughout the state represented an initial system-wide research study of very high relative priority.

The conference participants asked that a representative of the staff of the governing board meet with the council of deans of student personnel, an interinstitutional group concerned with student affairs policies, to obtain the reaction of the council's members to the proposed project, which would call for a self-report questionnaire to be administered to new undergraduate students registering for trimester III, in April, 1966. The inventory was to be designed to yield a profile of the entering class at each university. Although each university would ask for data to suit its own purposes, each institution would also include in its questionnaire several items seeking to obtain from the students information about their plans for graduate and graduate professional study, information of great interest to the universities and governing board alike. The council of deans of student personnel endorsed the project, and subsequently, each dean named a person at his university to work with the board's staff in developing a self-report instrument that would serve the dual purpose of gathering student information of specific interest to each of the universities and of providing data that reveal the nature and direction of developing enrollment patterns.

Data processing of the results was done at the universities, with print-out summaries furnished to the staff of the governing board. In June or July, a conference of the university representatives taking part in the study will be called to (a) assess the outcomes of the April, 1966 tryout administration of the inventory, (b) consider the design of a standardized instrument for possible use throughout the state system of universities in subsequent registration periods, and (c) review the advisability of recommending that discussions of the project be extended to the public junior colleges. In Florida, public junior colleges are not under the same board that governs public universities, but are under the control of county school boards. A division of community junior colleges, an agency of the state department of education, provides advisory and coordinative services to the junior colleges.

The planning considerations for system-wide research that emerged from a conference of institutional research officers have been cited and the broad structure of an initial study calling for the utilizing of academic input on a system-wide basis has been presented.

The remainder of this paper will be devoted to relating the six issues already presented to the operational aspects of the project. This equating of system-wide planning to system-wide research implementation was effected in an attempt to determine the degree to which planning actually structured the carrying out of the project.

1. Criteria for determining the significance of a proposed research project. As stated earlier, the planners proposed that research both at the institutional level and at the system level, be designed to yield findings for validating role and scope. Institutional role and scope, as well as system-wide educational functions and goals, are set forth in Florida's tentative master plan. The master plan embodies the expectation that a majority of the students entering two of Florida's oldest institutions, the University of Florida and Florida State University, will have the intention of entering graduate study or graduate professional work after obtaining the baccaulaurate degree. The majority of students entering the newer universities will not have the expectation of graduate work at the institution in which they enrolled initially. This assumption about developing enrollment trends related directly to an assumption about the ability levels of students who enter the various universities. The proposed project, by obtaining input data in the form of self-reports from all new students throughout the system concerning their long range educational plans met the criteria that the research should relate directly to role and scope studies and to the state's master plan.

2. Limitations of input data collected at separate institutions. In past years, each institution had already gathered, in one form or another, nearly all the data that the self-report inventory elicited. There were two problems involved in using the data previously obtained by the university: information retrieval would be difficult, and secondly, the items responded to by the students in filling out admission forms, etc., were dissimilar, and consequently, responses to these items were not completely comparable. The administration of a self-report inventory to all the universities seemed a way to resolve both problems. The questionnaires given in each university were not identical, but each questionnaire contained a common core of items designed to obtain responses appropriate for comparative analysis.

The problem of lack of standardization in the collection of input data on a system-wide basis needs to be resolved each time a project is undertaken. The steps taken to insure comparability of data for the project being discussed were tailor-made for this project, and would not necessarily be effective nor appropriate for a study of a different nature.

3. Assistance (financial and personnel) that an individual university is expected to provide and to receive as a participant institution in a system-wide problem of study. In planning the project through the summer of 1966, no great financial and personnel demands were made on the universities. The basic questionnaire was prepared by the research coordinator at the board level, and referred to co-investigators at each university, who added items of interest to the universities without changing the defined core of items that required new students to report their long-range educational plans. In three of the five participating universities, a student questionnaire had been given in the past, so there was no difficulty at these three institutions in finding a time in the orientation period for the administration of the instrument or for arranging for a person to supervise the administration. The other two institutions also arranged for the inventory without too much apparent difficulty although the activity was in addition to their orientation programs.

Data processing offered no problems, inasmuch as each institution possessed data-processing personnel and equipment. Even if the project makes the transition from an experimental tryout study to a continuing program for gathering input data, there will be no undue added burdens placed on the universities.

All cooperative projects, whether complex or relatively simple in design and purpose, should be reviewed to determine the money and time needed to support them. This review should be a part of the prior planning. Its omission from the planning phase could jeopardize the development of the operational phase of the research.

4. Methods of communication among researchers in various institutions. State-wide conferences of participating researchers and visits by the research coordinator to the several campuses, supplemented by telephone and regular mail, comprised the avenues of communication. Insofar as this project was concerned, there was no lack of opportunity for the participants to exchange views, ideas and suggestions. The research coordinator found that issuing a progress report, containing a statement of the status of the project at each university, was helpful to him and to the co-investigators.

Travel to and from the cities and towns in Florida in which the universities are located is neither difficult nor easy, although the geography of Florida makes travel expensive. When state-wide conferences are held the university representatives must pay their travel out of their own budgets. To hold down travel expenses, conferences will probably be scheduled only semi-annually. A Watts line (a contractual arrangement between the governing board and the telephone company to allow long-distance calls for a set monthly fee rather than on an individual-call basis) greatly facilitates communication without additional cost.

5. Responsibilities of the research officers at the state level in inaugurating and implementing system-wide research. Institutional researchers are busy people. System-wide research is not likely to occur unless the researcher at the board level accepts the responsibility of scheduling state conferences, assisting in arranging for conference programs, and establishing liaison with other state-wide planning groups (such as the council of deans of student affairs).

Other than the above generalization, I shall not be too definitive about the responsibilities of the research officer at the board in initiating and coordinating system-wide study. Were this paper being given one or two years from this date, perhaps I could depict the role of this researcher in greater detail. Before leaving this particular topic, however, I'd like to suggest at least two personal qualities that the investigator at the state level should possess: a capacity for empathy with institutional research officers, and a willingness to participate in group planning.

Approaches to establishing a productive working relationship among the research staff of the governing board, the institutional research officers in the universities, and other university and governing board officials who have a role to play in research. To spell out a comprehensive rationale for the research officer to follow in bringing about a productive relationship with the members of other staffs and agencies in the governing board and in the universities would be as difficult if not more so than the task of defining the role of the research officer in inaugurating system-wide studies. Quite properly, the institutional research officers who attended the planning conference recognized the need for concentrated efforts on their part to seek to achieve a productive working relationship in the wider communities of the board and the university faculty. I strongly endorse the principle that this relationship be sought, but I cannot at this time define specific strategies to implement the principle.

Certainly the general guideline may be advanced that there must be communication and liaison among the research staff of the governing board and the other staff components of the board. System-wide research and research in the universities, despite real differences, have at least one common aim at both levels research is intended to produce findings that support sound educational decision-making. But if research is to aid decision-making, it must focus on significant educational problems and issues. A researcher, whether on a university research staff or on the staff of a governing board, identifies these issues by involvement with persons who are confronted with the dual task of assessing established policies and formulating revised policies. Many of these persons will be found by the researcher to be outside of his immediate circle of colleagues.

The rapid expansion of Florida's university system under a single governing board has been described briefly and the critical need for an expanding program of supporting research has been portrayed. The origin and development of a specific project that made use of input data has been traced. An account of the operational phase of the project has been given, and the planning considerations raised by the institutional researchers prior to the launching of the study have been used as yardsticks to assess the interaction between planning and implementation.

Before this paper is ended, the point should be emphasized that this study described to you does not represent Florida's first venture into cooperative studies involving the several state universities. Budgets have been built, personnel policies established, and admission standards evaluated. Sustained and penetrating effort has been made by the universities, working together under broad guidelines established by the governing board, to define institutional role and scope. At the same time, a master plan for the state system has been developed.

The uniqueness of the project discussed in this paper lies in its utilization of input data in a manner designed to relate present operations to the educational goals manifested in the state master plan. To validate the master plan, at least in part, was from the beginning, the central objective of the research. In seeking to attain this hoped-for objective, the research may have, as a by-product outcome, contributed in a degree to validating suggested strategies by which research personnel in the universities and the governing board may work together. As this system-wide research project utilizing input data moves into its final stages, the second outcome is looming fully as significant as the first.

THE INFLUENCE OF GEOGRAPHIC ORIGIN AND CAMPUS PROXIMITY ON STUDENT QUALITY AT STATE UNIVERSITIES

*Ross Armstrong
University of Minnesota

The increasing number of students wishing to enroll in state universities and colleges each year has led to serious considerations relating to a limitation of enrollments. The limiting of enrollment as is generally viewed by college admission offices, means selecting those of "greater" academic ability and excluding those of "lesser" academic ability. Limitations of enrollment also requires the choosing of criteria which will best predict academic success and then limiting enrollment to those students who best fit the criteria which are chosen. Such a practice has been common among many private universities for some time and among most state universities in recent years. However, the admission offices of private institutions, and to greater or lesser degree those of state universities, are not required by state charter, as is the University of Kansas, to accept all graduates of accredited high schools in their states. Whether such mandates are reasonable or realistic is not the point here, they are facts of life; and the problems concomitant with such facts must be dealt with, within the framework in which the University finds itself. It is not the intention of this report to consider the intricacies of the arguments as to who should be educated but rather to consider one aspect of resolving the problem of the disposition of the burgeoning number of applicants wanting to enroll in the University each year.

This paper deals with two major problems: (1) the selection of students to be admitted to the university, and (2) future schooling arrangements for those who are denied enrollment at the institution practicing selective admission. These two problems are discussed in terms of the geographic origin of students from the State of Kansas now attending the University of Kansas, the academic standing of these students in their respective high schools at the time of high school graduation, and the academic success they experience at the University. The supportive data for the study of the geographic and class rank origin were collected over a five-year period and includes the entering freshman classes for the years, 1959-1963. The grade study by area of origin is based on all students who were enrolled at the University during 1962-63, the last year of the study. Though this study is restricted to a singular geographic region it is, I believe, a situation common to many state universities, particularly those located in the more populous areas of their states.

In Table 1 when the resident students are divided into two groups according to geographic origin, those coming from high schools within a thirty-five mile radius of the University, a reasonable commuting distance, and those coming from high schools beyond the thirty-five mile radius, it is apparent that the University in general serves two distinct kinds of student groups. Almost 24 per cent of those coming from high schools within thirty-five miles of the campus ranked in the bottom half of their high school graduating classes while only 11 per cent of those from high schools farther than thirty-five miles away ranked in the bottom half of their graduating classes. The sizable difference in percentages is accentuated in importance even more when numbers of students are considered, since 46 per cent of the enrolling resident freshmen at the University come from within this thirty-five mile radius of the campus.

Studying class rankings in high school graduating classes of students entering the University and the locations of their high schools, we find in general that the farther from the campus the student's high school is located, the higher the students stand as a group academically from a given high school in their graduating class. If one were to limit admittance to the University according to some arbitrary high school class standing, as is usually the case in selective admissions procedures, for example, the upper half, the largest number of students to be restricted would come from within thirty-five miles of the campus. Since the state colleges and universities of Kansas do not practice selective admission of entering freshmen based on high school class rank and on admissions test scores, no college admission test results are generally

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*Formerly Director of the Bureau of Educational Research at the University of Kansas

TABLE 1. GEOGRAPHIC PROXIMITY AND CLASS RANK ORIGIN OF STATE RESIDENT FRESHMEN ENROLLING AT THE UNIVERSITY OF KANSAS FOR A FIVE-YEAR PERIOD

Proximity of High Schools to University	N	% of Total	% →	Top 10%	High School Graduating Decile Groups								Bottom 10%
					2	3	4	5	6	7	8	9	
0-35 Miles	3093	46.4	%	23.7	16.4	15.1	11.9	9.0	7.3	6.1	4.9	3.3	2.3
	→→→→		cf%	23.7	40.1	55.2	67.1	76.1	83.4	89.5	99.4	97.7	100.0
Beyond 35 Miles	3574	54.6	%	38.2	20.4	14.3	9.5	6.1	4.4	2.7	2.1	1.6	0.7
	→→→→		cf%	38.2	58.6	72.9	82.4	88.5	92.9	95.6	97.7	99.3	100.0
0-100 Miles	3687	55.3	%	26.8	17.1	14.8	11.6	8.3	6.7	5.4	4.3	3.0	2.0
	→→→→		cf%	26.8	43.9	58.7	70.3	78.6	85.3	90.7	95.0	98.0	100.0
101-200 Miles	2245	33.7	%	36.1	20.4	15.1	9.3	6.2	4.7	3.2	2.8	1.4	0.8
	→→→→		cf%	36.1	56.5	71.6	80.9	87.1	91.8	95.0	97.8	99.2	100.0
201 Miles and Beyond	735	11.0	%	39.6	19.7	14.2	9.7	6.7	4.1	2.0	1.3	2.0	0.7
	→→→→		cf%	39.6	59.3	73.5	83.2	89.9	94.0	96.0	97.3	99.3	100.0
TOTAL	6667	100.0	%	31.4	18.5	14.8	10.6	7.4	5.7	4.3	3.4	2.4	1.5
	→→→→		cf%	31.4	49.9	64.7	75.3	82.7	88.4	92.7	96.1	98.5	100.0

available either in quantity or free enough from bias to be useful in studying a division based on this type of instrument. If the University were to consider high school grades and class rank to be reliable predictions of academic success as can readily be obtained, and were to limit enrollment accordingly, what provision could or should be made for the further education of the large number of students who would be turned away?

As has been pointed out, a large number of these students would be from high schools within thirty-five miles of the University of Kansas. First, let us consider this area which includes the state capitol, a city of approximately 120,000, the University's city itself, with some 30,000 residents; and the Kansas part of the Greater Kansas City area. The area of Greater Kansas City which is included consists of commuter suburbs for an adjacent state's metropolitan area and the metropolitan area of Kansas City, Kansas. These major population centers together with several other smaller cities make this one of the most densely populated areas in Kansas. In terms of student population, 26 per cent of the state's college-bound youth come from this area as well as 26 per cent of the state's high school graduates. Although the percentage of students from this area who go to some college is little higher than the percentage of college-bound youth for the rest of the state, 51 per cent for the former as contrasted with 50 per cent for the latter, one might reasonably expect that comparable percentages of the two groups would enter the University of Kansas. The facts are that (1) 11 per cent of the high school graduates of the adjacent thirty-five mile radius area enroll at the University while only 4 per cent of the graduates of the remainder of the state come to the University, and (2) the University gets 21 per cent of its entering freshmen from the adjacent area and only 9 per cent from the region beyond, a ratio of approximately 2 1/3:1, whereas the relative numbers in the two groups represent a reverse ratio of approximately 1:3.

To better focus on the immediate problem, suppose we were to consider as ineligible for admission the 24 per cent of the students coming to the University who live within thirty-five miles of the campus, who are ranked in the lower half of their graduating classes. Obviously, these students cannot be absorbed by the other universities in the area because they, too, are not only experiencing over-crowded conditions but are contending with the problem of whether to attain excellence by similar means. To serve these students, might it not be reasonable to provide another institution with different requirements and curriculum somewhere within the area? Possibly such a school could begin as a junior college, expanding into a four-year college at a later time. Several examples are available to illustrate that the four-year college is able to relieve pressures considerably more than is the less prestigious junior college. The curricula could be geared to the needs of the students enrolling and these needs might be assessed by studying current trends in the progress of comparable students now enrolled at the University. Perhaps it is too much to expect one institution to be all things to all people; but it may not be too much to expect different institutions for different students.

As the population of Kansas, or for that matter the nation, becomes greater the role of the universities may change. Some institutions may be fortunate enough to control to some extent the course which they will follow in the future; others may be overwhelmed by local demands and needs, a phenomenon seen in secondary public education since the turn of the century.

For the immediate future, however, it seems that if the State University does not practice selective admission for state resident students, it is obligated to serve two functions. It must provide two "tracks," one a program for top quality students and two, a program for the local area students of lesser academic ability. There must not be a single program to which the lower caliber students come through the "open door" with the misguided illusion that some day they will graduate only to find that they are the chaff thrown out from the machine when, in fact, they might some day have received a college diploma if they had enrolled at some other institution.

If selective admission were to become a reality, as is quite possible then the area surrounding the University should be considered for a supplemental program financed at state expense to serve those diverted because of the selective entrance requirements imposed by the existing institution. Often it has not been considered practical to place two state-supported institutions in close proximity, because of competition and the apparent duplication of effort. This, I fear, is the politician's reason or for that matter the academicians of the existing institution of higher education who fear that they will lose some of the monies from appropriated funds or some of the local prestige they enjoy with their academic monopoly. Paradoxical as it may seem, the faculty and administration of a university seeking "excellence" often have another reason for opposition which I will mention later. However, if selective admission is practiced, it becomes necessary to make provision for higher education near the homes of students, especially in a populous area where high school students are highly college-oriented.

When investigating this problem, another question which seems to need an answer is that of student quality as measured by academic success at the University. For several reasons, it seemed best to use as the criterion the cumulative grade-point average at the University of all undergraduate classifications. The grade-point averages according to distance of the high school of origin from the University are presented in Table 2.

The cumulative grade-point average for groups from differing distances from the campus increases progressively from the nearest to the most distant proximity classification, with the exception of the last classification. It appears that school size, urban/rural location, and high school programs specifically articulated with University programs are directly related to academic success at the University as measured by course grades.

These very delicate problems are currently being studied in great detail as another part of the larger investigation from which this report was drawn. As an example, there is a region composed predominantly of small high schools in rural areas well beyond the sphere of influence and contact with the University, particularly as it relates to high school-university academic program articulation. The University has very limited formal contact with the schools of this area and provides it with few teachers.

TABLE 2. MEAN CUMULATIVE G.P.A.'S OF STUDENTS FROM REGIONS OF DIFFERING PROXIMITY TO UNIVERSITY CAMPUS (ALL UNDERGRADUATE CLASSIFICATION LEVELS)

Proximity of Origin H.S.	Mean Cum. G.P.A. (3.0=A, etc.)
0-35 Miles	1.28
0-100 Miles	1.32
101-200 Miles	1.54
201 Miles and Beyond	1.44
All State Resident Students	1.37
All Out-Of-State Students	1.34

Whether the problem of how to provide for students of differing abilities can be resolved remains the great question. The "academics" of a university resist any contamination of the University domain by "vocational type programs" for those students of lesser potential. Generally they have been successful in their efforts to eliminate, curtail, or deter the development of "non-cultural" programs within the confines of the university. Additionally they resist state efforts outside the university's control, fearing competition for available funds. This is a rather interesting paradox when one considers the widely-accepted belief that faculties of institutions of higher education tend toward liberal views concerning both social and political matters.

Institutional officers more vigorously than ever before are seeking endowments and foundation and federal support which, in that order, are in prestige value, parallels of inherited wealth. The origin and proportion of these funds seem to be the "image maker." In order to qualify for these funds an institution must present at least a facade of "excellence." Usually the most overt of the efforts to gain a reputation is to have highly selective admission requirements and wide geographical representation among the students. These factors are assumed to attract an equally competent faculty and as a consequence of all this the institution becomes eligible for the "bigger and better" funds.

Selective admission, I fear, is in vogue because it is easy to use and is the best servant of the universities. Resorting to increased selectivity in admission is a threat to legislators on the one hand and good justification for additional tax monies on the other.

There is no sound basis for arguing who gains most from exposure to an education, the superior or the average ability student, other than that the faculty likes to work with the former group more and that they serve the "image" better. This is particularly interesting when those schools practicing selective admission give lip service to "excellence" but take very little action design to limit the actual enrollment of the institution to an optimal numerical level. Instead, the schools continue to accept students with high potential and use these numbers at the same time to elicit greater state funding.

Their willingness to wrestle with the great numbers is not altruistic by any means. Two reasons seem apparent: (1) "bulging at the seams" provides justification for greater support and sympathy from the legislatures which appropriate the very necessary "non-prestigious money," and (2) it is well known that "academic greatness" is not necessarily a positive correlate of enrollment. Yet a state university generally resents the fact that a neighboring state counterpart has more students.

This is probably the result of several factors but one seems to sense that once a state school accepts the fact that it realistically cannot identify with the most prestigious private school type of institution it compromises instead on the "best of the lot" among state universities. The mythical "best" by some coincidence also appear to be the largest, so I suppose this is the reason for the paradoxical situation.

Trying to combine the most desirable attributes of private and public institutions in an attempt to make an even more effective combination is often very difficult if not impossible. In the quest of institutions for "excellence," the student of average or lesser ability is left without access to a state institution of higher education. The junior college or state college has been offered as the alternative solution to this problem but there still remains an "image" problem: which by no means can be passed off as being unjustified in many instances.

In another study of the "upper half" of the graduating seniors from Kansas high schools who did not go on to college it was found that thirty-eight per cent of the boys and thirty per cent of the girls would have gone to college had a public-supported school of their choice been within fifty miles of their homes. A not uncommon comment concerning this finding has been that students are too "picky." Even if this is true, the situation suggests that there are real reasons why students forego college rather than attend some alternative school.

Proximity to students is not the single factor tending to lower student quality at institutions but it is a very important factor that must be recognized when state universities propose more selective methods for admitting students. The consequences must then be considered when planning additional institutions or programs, not only in terms of physical capacity but also in terms of student-population quality.

In terms of consequences to the University in public relations, student-university proximity and the associated problems are of great importance. In all likelihood, these relations are very directly influential on the legislative groups enacting appropriation legislation. Unless the university serves the entire state, it cannot expect to obtain general support from the areas remote to the university campus.

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A PRELIMINARY REPORT: EFFECTS ON STUDENT ACHIEVEMENT OF RESIDENCE HALL GROUPINGS BASED ON ACADEMIC MAJORS

James K. Morishima
University of Washington

Science and technology are making exponential progress. Some of its theoretical and technical achievements have already been adapted by education--e.g., educational institutions have recently begun to use closed circuit TV in teaching, the guts (programs) of automated self-instructional devices (teaching machines) have been developed and are gaining wide-spread acceptance and enthusiasm, and computers are being used to process grades with increased speed and accuracy (but not necessarily increased accuracy of assessment). In addition many new developments in industry (e.g., input-output formats, processing, etc.) are readily adaptable to educational usage. Research in the behavioral and social sciences is adding rapidly to our expanding knowledge of what makes Homo Sapiens tick.

But we who are concerned with higher education are often hard put to keep up with these new developments, and due to various administrative, technical, and psychological reasons we often find it difficult to adapt or implement these new developments into our educational systems. This report sketches some research developed at the University of Washington and some of its attendant technical and administrative difficulties.

We are concerned with the question, "Are colleges and universities applying new developments to higher education to maximize the educational output of their students?" More specifically, can a state university (such as the University of Washington) utilize the suggestions of an increasing number of social and behavioral scientists that the out-of-class social interaction of students may be an educational, or countereducational, force worthy of study by university administrators and faculty?

The position expressed by this paper is that the individual member is shaped and molded by the attitudes and behavior of his peers. Although all the details of group pressure toward conformity will never be in, there is sufficient evidence for this position to permit reasonable administrative action.

Sherif (1935), Asch (1951), and Crutchfield (1955) have demonstrated extreme conformity by college students to peer pressures in laboratory situations. Several students of higher education--e.g., Trow (1959), Reisman (1959), and Freedman (1956)--are convinced that student subcultures effectively shield the individual students against any significant influence by the faculty. Some observers of higher education suspect that the insulating influence of the mass youth culture may account for Jacobs' (1958) conclusion that most colleges make few significant changes in most students. The importance of advanced intellectual concerns, e.g., scientific method, a definition of truth, fades readily when no one is interested in them or when such concerns are grossly or subtly punished.[1]

Freedman (1956), after an intensive study at Vassar, said that the student culture is the primary educational force one finds at work in college and that the influence of college culture on scholarship is a leveling or moderating one.

Clark and Trow (forthcoming) propose that the effective size of an institution may be reduced by creating small communities in the larger organization. They feel the residence halls are one area in which these communities may be established.

In his consideration of peer group influences, Newcomb (1960) states that in order to foster peer group influence the academic administrators must insure that students have some exciting academic experiences and someone with whom to share these experiences. He goes on to state,

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[1] The author is indebted to R. E. Guild for permission to use sections of his mimeographed paper, Student Subcultures at the university of Washington: A Preliminary Analysis and Proposal.

"If academic and intellectual excitement is introduced into the common experience of peer groups, all their power and influence can be brought to bear upon academic and intellectual concerns."

Sanford (1959) says:

> Finally, it is worth re-emphasizing that the organization of the college as a community has profound effects on student life in ways that have been given too little consideration by administrators and too little study by scholars. . . Nevertheless, what we have said about the effects of size and impersonality, of the dilution of intellectual interests among great numbers of students and their neglect by a faculty which deals with students fleetingly and in the mass, suggests that structural innovations working against these anti-intellectual forces might contribute to the growth and maintenance of academic and intellectual subcultures among at least a significant minority of students. The main thing is to get such students together so that they can stimulate and support one another's often precarious commitments, and to provide direct and personal encouragement and rewards for such commitments by similarly committed faculty members. This requires serious effort by the administration and at least a part of the faculty to minimize the "people processing" aspects of mass higher education.

The publications then are down to two themes. First, the academic endeavors of students will be enhanced if they are in a social context which permits and invites out-of-class interactions pertinent to the content of the curriculum. Second, living groups provide a logical setting for investigating the relationship of social context to academic work. Since most educators would insist that a university utilize all its available resources in enhancing its educational processes, there must be strong concern for the way the residence halls influence students' educational attitudes.

The present study employed the residence halls to investigate the important educational effects suggested by the preceding statements.[1]

The establishment of a new residence hall unit on the campus of the University of Washington enabled the construction of experimental groups without disrupting pre-existing groupings.

Design

This study was designed to determine the effects of one manipulation--academic major--upon the education of students. The following statements derived from published discussions were under investigation:

1. If students with common academic majors live in physical propinquity they will exhibit superior academic performance, form a more congenial group, and be better satisfied with living arrangements than will students who are surrounded by a group of peers heterogeneous with respect to academic major.

2. No difference will be found between academically homogeneous and academically heterogeneous residence hall groups of repeated measures of general education, attitudes, values, and behavior, i.e., groups will not differ in direction or amount of change on such measures.

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[1] For the first preliminary report of this project see Morishima, J. K., Hodgson, T. F., and Bell, R. J. Effects of Resident Hall Groupings Based on Academic Major. October, 1964. A limited number of copies are available from James K. Morishima, Acting Director, Office of Institutional Educational Research, 207 Commodore, University of Washington, Seattle, Washington 98105.

From these general statements of the problem, a number of explicit hypotheses have been derived. These hypotheses and the preliminary findings are listed in the Appendix. This set of hypotheses is not necessarily exhaustive of all experimental effects which might be tested. Other important effects which develop will be singled out, observed, and evaluated during the course of the experiment.

The study is distinctive in the following manners:

1. It randomly assigns individuals of the same academic generation to academically homogeneous (experimental) groups and to control groups of the same major assigned randomly throughout the residence halls.

2. It allows comparisons between the experimental and control groups on measures of retention, attitude change, participation in social activities, and the like. In addition, it provided a foundation for manipulations in a new residence hall housing eight to ten students around a common lounge.* This residence hall opened in 1965 at the University of Washington.

New entering students in Fall, 1963 were randomly assigned to the experimental and control groups on the basis of declared academic major. Each experimental group occupied one wing (24 students) of a floor. Students in the experimental groups were assigned blocks of rooms on opposite sides of a hallway.

Two experimental groups of male students were formed. One group of 24 was assigned to the experimental floor of the coed hall. Controls were placed on other floors in the coed hall and the Men's Residence Halls. A second experimental group of 24 was placed on a floor of the Men's Residence Halls with controls scattered through the rest of the halls.

While the original design called for one control group in the coed hall and one in the noncoed hall, it was found that very few of the measures were affected by the hall setting (coeducational or noncoeducational). This led to the ability to establish more experimental and control groups because of the smaller number of subjects necessary for combined experimental and control groups and to increasing the size of the present control groups, i.e., members of the control group can be pooled.

Interviews with members of the experimental and control groups and a random sampling of other residents of the residence halls were conducted. The purpose of these interviews was to ascertain the quality of the relationships between an individual and his peers. For example, it was possible to find the extent to which an individual discussed personally and intellectually significant matters with his peers. These interviews will be continued as an integral part of the study. Hopefully, these interviews will continue (a) to give the experimenters further knowledge of the effects of the manipulations, and (b) to further reinforce the experimenters' behaviors, i.e., that interviewees will continue to praise homogeneous groupings.

Administrative Difficulties

The one decision which raised the most difficulties was the attempt to exclude or experimentally control the Hawthorne Effect. An advisory committee composed of many academicians stressed the importance of carrying out the research without alerting the students. As will become apparent later, the advice from the ivory towers was fraught with danger.

The administrative difficulties encountered might be briefly listed as follows:

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* Experimental groups have been established in this unit. Groups have been assigned not only on the basis of major but also on the basis of such interests as "academically oriented," "socially oriented," and the like. Because of their small size, these units will allow more refined small-group research possibilities.

1. The inability of maintaining the homogeneity of the groups without arousing the suspicions of the students.

2. The necessity of keeping the details of the study from the residence hall advisers. This procedure led to friction between the residence hall managers and their advisers.

3. The dilution of the experimental groups as the academic year progressed.

These difficulties led to a major revision of the experimental design. It was evident that the Hawthorne Effect could not be kept out of the experiment without ruining it entirely. Sanford* suggested notifying all students in the experimental and control groups of the study and making the study voluntary. He felt that the Hawthorne Effect could thus be effectively nullified. Newcomb** agreed with Sanford and suggested that those enmeshed in the ivory towers may be so concerned with purity and so blithe about possible administrative and practical difficulties that following their advice would lead to so many problems as to make experimentation practically impossible. It was decided after many deliberations that the students and the advisers should be made aware of the study. This would enable the management and the advisers to tell students frankly why they were not being allowed to move into certain rooms. It would also enable reconstitution of group homogeneity.

A general statement (which referred to a previous announcement that the studies would be conducted in the residence halls) was made during the spring quarter of 1964. These statements were supplemented by visits to the experimental groups by the three principal investigators. At these sessions questions were answered and a belated attempt was made to explain the study in greater detail. At no time were the hypotheses under investigation ever explicitly revealed to the students.

The announcements were accepted by the group housed in the coed hall without incident. However, the announcements caused a great deal of consternation in the Men's Residence Halls where an experimental group of engineers was located. The objections centered around the principle of nonvoluntary participation. It was also felt that this grouping would be harmful to the students and to the student government organization. However, the president of the house argued as follows:

> The engineers eat together, they study together, they help one another in their course work. They are a clique and spend their leisure time together. They talk about subject matter more than normal students do. They are obtaining higher grades and are more satisfied with the residence halls.

His objections seemed to indicate that engineering students were actually validating the hypotheses under investigation (at least on a subjective basis). The house president had two major objections: (1) the students were assigned to their rooms in the experiment without their prior knowledge and consent; (2) the engineers were not interested in participating in the house activities.

The issue unfortunately became one of rather widespread concern and was poorly handled by the campus newspaper. Newcomb*** suggested that close cooperation with the campus newspaper is highly desirable and said he has always endeavored to keep them informed of the progress and nature of the studies (practical, not theoretical studies) he has performed.

It is worth noting in passing that the protests of the house members over the conduct of the study were made primarily by the house members who were not directly involved in the study. That is, the engineers in the experimental group generally favored the project. What impact the uproar had upon the experiment is difficult to determine.

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* Personal communication October, 1963.

** Personal communication 1964.

*** Personal communication 1964.

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APPENDIX

HYPOTHESES AND PRELIMINARY FINDINGS

It was not expected that the results of the manipulation would be self-evident by the end of the first two years of the study, and so what follows is highly tentative. The results are presented more for the implications of this type of study than to demonstrate its effectiveness. A number of the hypotheses cannot possibly be tested, e.g., H_3--proportions of attained baccalaureates. In addition, statistical tests are very difficult to conduct with the small numbers of students involved in the study.

Further, the uproar in the residence halls over the announcement certainly caused some effects. Beyond the obvious possibility of students leaving the halls because of the manipulations, certain other effects may have taken place.

Each hypothesis is listed below and a brief summary of the results of statistical tests is made.

1. Experimental groups will exceed control groups (achieve larger measures) in:

H_1 Mean All-University achieved GPA minus mean All-University predicted GPA

There was no significant difference although there was a tendency for the experimental group to exceed the control group on this measure.

H_2 Mean major achieved GPA minus mean major predicted GPA

There is a tendency for the experimental group to exceed the control group in this measure ($P = .15$).

H_3 Proportions of attained bachelor degrees at U of W

No test possible.

H_4 Proportions entering graduate and professional schools

No test possible.

H_5 Sociometric values indicating patterns of friendship within given house.

Sociometric test not administered due to the reaction in the residence halls to the announcement of the study.

2. Experimental groups compared with control groups will show fewer:

H_6 Changes of major

There were twelve changes of major in the control groups and two changes of major in the experimental groups. The difference is not statistically significant.

H_7 Withdrawals from the University
a. Pre-baccalaureate transfers to other institutions
b. Permanent withdrawals
c. Temporary withdrawals

During the first two years of the study the members of the experimental group tende to make fewer withdrawals ($P = .13$).

H_8 Academic disciplinary actions

While there were fewer disciplinary actions for members of the experimental group, the difference was not statistically significant.

H_9 Moves from residence halls

Because of the reaction of the students to the announcement, no test was made of this hypothesis.

H_{10} Requests for room changes

There was a statistically significant difference ($P = .04$) between the experimental and control groups on this measure after two years and one quarter. Control group members tended to leave the residence halls and/or move to other sectors of the halls.

3. Experimental groups compared with control groups will show, between pre- and post-testing, on the Omnibus Personality Inventory:[1,2]

H_{11}[3] Greater positive changes on factor of scholarly orientation; this factor is characterized by high scores on four subscales: Thinking Introversion, Theoretical Orientation, Estheticism, and Complexity.

H_{12}[3] No differential change with respect to the other twelve subscales: Autonomy, Developmental Status, Impulse Expression, Schizoid Functioning, Social Introversion, Religious Liberalism, Social Maturity, Masculinity-Femininity, Repression and Suppression, Nonauthoritarianism, Lack of Anxiety, Couch-Kenniston.

4. Experimental groups will report more frequent discussions compared with controls about:

H_{13} Curriculum and course content

Although no actual test has been conducted to verify this hypothesis, anecdotal information would tend to indicate that experimental group members do discuss their curricula and course content more than members of the control group.

H_{14}[3] Intellectual matters not specifically major-oriented

H_{15}[3] Experimental groups compared with controls will report less frequent discussions about content described by Clark and Trow as "lowest common denominator of student life"

H_{16}[3] Experimental groups will not differ from control groups in dating behavior and contacts with opposite sex

H_{17}[3] Control groups within the same major designation will not differ from one another on any of the measures

The sketchy results reported here showed sufficient promise to enable the researchers to establish another experimental group in the coed hall at the beginning of the second year. The

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[1] Center for the Study of Higher Education. Omnibus Personality Inventory--Research Manual. Berkeley, California: 1962.

[2] Since this instrument was administered on a voluntary basis, a number of students (one-half) did not complete the instrument. In addition, the computer program prepared for the analysis of the Inventory has not yet been debugged.

[3] No statistical tests were made. Interview protocols on these areas are ambiguous and imply no differences.

data for this experimental group have not as yet been analyzed. Further, when the new residence hall mentioned previously opened for occupancy in September, 1965, several experimental groups, each containing eight to ten people, were established. These groupings were based on broad interest groups and not necessarily on academic major. Whether this type of grouping will lead to more startling effects will not be known for a few more years.

The experimenters remain enthused by the preliminary results of the study and look forward to its continuation. If the results are as predicted, the manipulations will continue to be made. In addition, the residence hall management, the faculty, the administration, and last, but by no means least, the students will benefit from this research. The researchers strongly hope that their experiences will enable others to carry out research of this nature without stumbling over the same obstacles.

METHODS AND RESULTS OF RESEARCH ON LIVING-LEARNING RESIDENCE HALLS

LeRoy A. Olson
Michigan State University

Since 1961, the emerging pattern of new residence hall facilities at Michigan State University has been one of coeducational halls incorporating living, learning, recreational, counseling, advising, and instructional facilities. (Olson, 1965) A typical new residence hall contains men's and women's residential wings connected by a central unit housing classrooms and other residential facilities. Recently, this pattern has been extended to existing residence halls by incorporating instructional, academic advising, and counseling facilities in these halls and converting residential complexes to coeducational units. Almost 15,000 students were housed in these coeducational living-learning units at the end of Fall Term, 1965.

Since the initial living-learning unit, Case Hall, was fully occupied in Winter term, 1962, a number of studies have been carried out to determine the effectiveness of various residence hall programs. These studies have utilized questionnaires, interviews, and analysis of examination scores. The results of the various types of studies, which will be considered in turn, were of considerable significance to individuals who must plan residence hall programs.

Student Questionnaires

Since little was known about student attitudes toward living-learning units, the first questionnaire contained a number of open-ended items. (Olson, 1963) This structure allowed students to comment on aspects of the situation which were not directly considered in questionnaire items. The attitudes of respondents toward life in the first living-learning unit, Case Hall, were extremely favorable. The residents especially liked the convenience of residence hall classes and the accessibility of instructors and advisors.

Examination of responses to the original questionnaire aided in the development of a questionnaire with a greater proportion of fixed response items. Such a questionnaire could be answered in less time and also avoided the problem of coding responses to many open-ended items. The new questionnaire was used after Wilson Hall, the second coeducational living-learning unit, was completed. The students were still as favorably inclined toward their residential units as in the previous year. In fact, students who had lived in Case Hall preferred the greater choice of classes, class sections, instructors, and social activities in the enlarged complex.

In 1964, it was decided that the attitudes of students in more traditional types of residence halls should be compared with attitudes of students in the living-learning complex. This complex now included a third unit, Wonders Hall, raising the population of the complex to almost 4,000 students.

A series of statements was developed with which a student could agree strongly, agree somewhat, disagree somewhat, or disagree strongly. These items were developed after consultation with instructors, residence hall managers, and student personnel workers. The device, known as the Student Attitudes Inventory, was administered to a ten percent sample of students in all residence halls. (Olson, 1964)

Copies of the Inventory were delivered to the head resident advisor of each hall, who then distributed them to the resident assistants in each house. The resident assistants then distributed a copy of the Inventory and a return mailing envelope to the first student and each tenth following student on their house list. This procedure resulted in an essentially random sample of all students residing in university residence halls. The completed forms were returned to the Office of Evaluation Services through campus mail. Thus, individual responses were not accessible to the resident assistant or to the head advisor of the hall. Students were assured that the results would be held in strictest confidence by the staff of the Office of Evaluation

Services and would be reported only as group data. Approximately ninety-five percent of the questionnaires were completed and returned. The fact that the questionnaires were personally distributed to the respondents by resident assistants was probably an important factor in the high rate of response.

The responses to the Student Attitudes Inventory items were key-punched on machine cards and were analyzed by sex and, within sex, by type of residence hall unit. (Olson, 1966) The statistical significance of the difference in response patterns of the groups was determined for each of the items by the chi-square technique.

The respondents, especially the women, agreed that a student should have a broad educational experience, including general education courses, exposure to humanities and the arts, and cultural activities such as lectures, concerts, and plays. Significantly more men than women agreed that the most important reason for obtaining a college education is that it is a good investment in a financial sense. These results are similar to those published in national studies. (Goldsen, 1960) A greater proportion of women than men indicated that they had respect for the views and rights of other students. A greater proportion of women than men accepted the idea of such instructional techniques as large lecture sections and programmed textbooks.

Significantly different patterns appeared when the attitudes of students in several types of residences were compared. (Olson, 1966) The male student having least in common with other males was the one living in a traditional residence hall. Such a man would agree more often than other men that the quality of the academic program in his major field compares favorably with that in other universities. He was less likely than other men to prefer courses of four to five credits rather than courses of two or three credits. He was less impressed with class discussion: in fact, he doubted that students welcome the opportunity to take part in discussion. He was more inclined to doubt that students value education for its own sake. He was not as seriously concerned as others that there be contact between students and instructors in every course, and he was less concerned that campus distances may prevent students from seeing instructors. He tended to feel that class assignments are not as definite and detailed as they might be. In nearly all these matters, he differed from students living in residences that include classrooms and faculty offices.

The typical female resident of a traditional residence hall also differed from other female residents. She thought it important that students select a major before entering college. She was less likely to agree that the university should enroll students from many racial, religious, and national groups. While she was less optimistic about opportunities to talk to a professor outside the classroom, she was less concerned that there be contact between students and instructors in every course. She was likely to feel that it is difficult to find a quiet place to study in her residence.

Men and women living in halls that were coeducational but lacked instructional facilities also had certain unique characteristics. The men were less strongly in agreement than were other men that all students should be exposed to humanities and the arts. They also felt that attendance at lectures, plays, and concerts is not as important as other men felt it was. The male resident was less likely to feel that it is difficult to study in his room. He felt a need for some personal student-instructor contact in each course.

The women in the coeducational residences were less convinced than other women that students have a responsibility to be worthy representatives of the university. They disagreed with the statement that an instructor should use a single textbook in order to make outside references unnecessary. They agreed more strongly than other women that student-instructor contact is essential in every course.

The typical male residing in living-learning units agreed that scholarships and other special considerations are available to students of high ability. He tended to agree less often that faculty should be employed without regard to political beliefs. He tended to agree that class assignments are usually very definite and detailed. He also considered it difficult to study in his room.

The typical female resident of the living-learning units agreed more often than other women that students have a responsibility to be worthy representatives of their university. She also found it less difficult to find a quiet place to study in her residence hall.

The above results are typical of the information furnished by the questionnaire technique. Attitudes toward class atmosphere, student-instructor contact, advising, study methods and conditions, student interrelationships, social activities, residence hall conduct, regulations, accommodations, and residence hall life were also considered. Knowledge of these attitudes helped administrators assess student acceptance of academic and non-academic programs in various residential environments.

In addition, comparisons were made between responses to the Student Attitudes Inventory of resident assistants and of students. Generally, more resident assistants than students placed emphasis on general, liberal education and less emphasis on grades. More of the resident assistants were in favor of independent study and fewer were in favor of such devices as programmed texts. A greater proportion of male resident assistants were in favor of closed-circuit televised instruction and large lecture sections while fewer female resident assistants than female students were in favor of these techniques. More resident assistants than students agreed that general living accommodations and study facilities were adequate. The resident assistants expressed less confidence in students with respect to cheating on examinations than did the students themselves. The resident assistants also perceived less need for recommendations by students concerning residence hall regulations than did the student respondents. The above comparisons were presented at a group meeting of new resident assistants in order to serve as the basis for discussion of student-resident assistant relationships.

While the construction of a questionnaire at the institutional level has the advantage of focusing on specific local problems, the opportunity to compare results with national surveys or surveys at other institutions may be limited. Use of commercially available student attitude surveys may be advantageous, especially when supplemented by locally constructed instruments.

A final comment on the questionnaires described above is that each questionnaire was used with the population or a sample of the population that existed at a particular point in time. Thus any analysis of trends in attitudes must be made with the realization that the populations surveyed were not identical. Extensive longitudinal studies of general aspects of student attitudes have been carried out at Michigan State University beginning in 1958. (Lehmann and Dressel 1962) The original sample contained over 2700 freshmen who were subsequently tested at various stages of their academic careers.

Faculty Interviews

An interview guide was constructed during 1963 when two living-learning units were in operation. (Olson, 1964) This guide consisted of items assessing faculty attitudes toward the living-learning units, allowing for exploration in depth of reasons for various attitudes. Each of the thirty-one instructors teaching in the living-learning complex was interviewed. The interview procedure allowed the establishment of favorable instructor-interviewer rapport. Faculty members seem to prefer a half-hour interview over a structured questionnaire such as those used with the students.

One of the high lights of the analysis of interview results was a feeling that instructor-student contacts outside of the classroom were more frequent in the living-learning units than on main campus. Furthermore, the instructors felt that these contacts were partially responsible for a more informal atmosphere in living-learning classes. On the negative side, some instructors were concerned about the loss of contact with other members of their departments on main campus. Some of them noted that the classroom facilities were more crowded than those on the main campus and that outside noise was a problem in some classrooms. Those instructors who were veterans of the Case-Wilson complex, having taught the previous year in Case Hall, were somewhat skeptical about the addition of Wilson Hall to the complex. Some of them felt that the informal student-instructor relationships which existed in Case Hall no longer prevailed due to the enlargement of the complex, but this attitude was not shared by the students who had lived in both situations.

Analysis of Examination Scores

The third technique used to investigate the success of the living-learning academic programs was to compare the achievement on common final examinations of students in the living-learning complex with the achievement of students taking the same courses on main campus. The aptitude of students was controlled by means of the analysis of covariance, using orientation test scores as the control variables. Size of section was also taken into consideration. The results were inconsistent, indicating that instructor ability also needed to be measured and controlled. Unfortunately, no quantitative measure of instructor ability was available. Nevertheless, mean examination scores in the University College courses, which are required of all students, are furnished to each of the University College departments for each of their sections, including those taught on the main campus and those taught in the residence halls.

Summary

Students and instructors indicated that their attitudes toward the living-learning units were quite favorable. Analysis of examination scores proved to be inconclusive, that is, students enrolled in residence hall sections did not consistently show greater achievement than students enrolled in the same courses on the main campus. Of the three types of studies discussed above, the investigation of student attitudes seems to have been the most valuable in terms of the number of individuals who found the results helpful in making appropriate decisions.

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ABSTRACT*

ESTIMATING GAINS IN SCHOLASTIC APTITUDE TEST SCORES ATTRIBUTABLE TO THREE SOURCES

Sam C. Webb
Georgia Institute
of Technology

During recent years there has been a gain in average SAT scores for entering freshman classes at a number of colleges. These gains may be attributed to three broad classifications of causes. "Non-college" factors include a variety of effects such as improved high school instruction, short term coaching, test wiseness, and increased societal incentives. Recruitment factors include such effects as family associations, characteristics of the college and recruitment efforts as are influential in causing a student to apply for admission to a particular college. Selection and enrollment factors include such effects as cause the student to be admitted and that cause him to enroll. Given average SAT scores over a period of time for the region from which a school selects its students, for all students who apply for admission, and for all students who enroll, it is possible to estimate how much of average score gains can be attributed to these three sources. A procedure for estimating these gains is described and illustrated.

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* The primary article for the material will be published in the Journal of Educational and Psychological Measurement.

CHANGES IN INSTITUTIONAL CHARACTERISTICS AS A FUNCTION OF SELECTIVE ADMISSIONS

Cameron Fincher
University of Georgia

Increasing demand for college education has turned the attention of college officials to selective admission as a means of coping with large numbers of applicants. The opinion is frequently voiced that colleges have no choice in the matter but must select applicants on the basis of their potential for successful completion of degree requirements. Concurrent with the opinion that colleges must be selective because of the admissions burden is the belief that colleges ought to be selective because it is unfair to students to permit them to enter when the probability of their early failure is high. Whether selective admissions or an open-door policy is desirable or not is a matter of educational philosophy. Whether selective admissions is necessary is a question lending itself more easily to empirical analysis.

The impact of a selective admissions policy on institutional characteristics is a subject little examined by those concerned with either admissions problems or selection techniques. Unfortunately, both groups appear to have focused too closely on the problems and techniques of selective admissions without taking up the larger issue of what the establishment of a selective admissions program will do to other factors and variables within the institutional setting. That selective admissions can radically affect an institution's reputation or image is more or less assumed, but the relationship between selective admissions and institutional characteristics is, at present, vaguely understood.

The purpose of this paper is to examine the role of a stringent admissions policy in the rapid transition of an open-door urban institution to an institution with elitist aspirations, if not actual accomplishment. An effort will be made to look at the impact of admissions policy, in so far as they can be determined, upon institutional characteristics when a concerted effort is made to change rapidly the: (1) educational philosophy under which a school has been operating, (2) the level of academic ability evidenced by students entering the institution, (3) the public image of the institution in the community it serves.

Institutional Characteristics Before Selective Admissions

The subject of this paper is a senior college located in a large metropolitan area in the South. Owing the great majority of its growth to the G. I. Bill and the increased demand for post-secondary education immediately following World War II, the college maintained an open-door admissions policy and offered a cafeteria curriculum. Applicants who had not completed high school were admitted as "adult", "special", or "irregular" students. Later they were permitted to take the General Education Development Tests and admitted as a "regular" student if they passed the tests at the level required by the State Department of Education for a high school equivalency certificate. Veterans were permitted to take the "college level" GED tests and by making satisfactory scores on all four tests could be exempted from as much as 50 hours of lower division academic work.

The curriculum of the college consisted primarily of course work with an "immediate cash value" in the community served by the college. Numerous diplomas were awarded for one or two years' work in a diversity of business or commercial fields. Innumerable short courses, training seminars, and special programs of all stripes and colors were offered to persons unable to enroll for a full quarter's work. Even those who did enroll for a full quarter frequently took a single course which was immediately applicable in the business world. Although authorized to confer the Bachelor of Commercial Science degree (and later the Bachelor of Business Administration degree), the college did not require a large auditorium for graduation exercises. To meet the needs of those students seeking some form of a liberal education, the college arrived at the delightful solution of offering the Bachelor of Commercial Science degree with a major in social sciences.

As would be expected, much of the initial work offered those seeking academic credit was of a remedial nature. For a decade or more the college experimented with various forms of remedial coursework in English, mathematics, and reading. An effort was made to provide such assistance as the student might need, and if there was at any time in American education a truly student-centered philosophy of education, one seemed to be in operation at this particular institution for the ten years following World War II. Although grading standards varied immensely from instructor to instructor and from department to department, there was throughout the ten years a gradual tightening of academic standards.

Because of the nature and location of the college, most of the coursework was offered during the evening. Indeed, the college was not initially authorized to offer daylight instruction but did so through the device of extending the evening through the afternoon to 1:00 p.m. and eventually to 9:00 a.m. Enrollment figures for the early years following World War II are not distinguished by accuracy. Because of the large number of students taking only one course, and because of the large number of students who enrolled and almost immediately withdrew, accurate enrollment figures on either a full-time equivalent or head count basis are unavailable.

The Initiation Of A Selective Admissions Program

The establishment of a selective admissions program at the college was the outcome of a series of changes in the college, the city and the state, and the nation's expectations for higher education. In 1957, the president of the college who had nursed the institution through the recession, kept it alive during the war, and fostered its rapid expansion of enrollment with G.I.'s retired, and a new president was elected. Other events in 1957 which are not at all unrelated was the launching of the Russian Sputnik and the ensuing national dialogue about excellence.

In the winter quarter of 1959 all admissions at the college, with the exception of a few transfer students, were closed down, and a radical shift in admissions policies effected. All adult or community education was discontinued; all short courses, training seminars, and other non-academic programs were stopped; so were all diploma or nondegree programs; hereafter the college was to admit only students seeking a four year degree. A trial run of the admissions program was made in the summer of 1959, and the program put into full force for the fall quarter of that year.

The admissions program established for the selection of new students was extensive, time-consuming, and expensive. In addition to College Board SAT scores and a high school transcript, all entering freshman applicants were required to take educational achievement tests in English, mathematics, natural science, and social studies (the following year a reading test was added to the battery of admissions tests). If satisfactory scores on the tests were made, the applicant was then "invited" to an interview with three faculty members. After interviewing the applicant for approximately ten minutes, the faculty members individually recommended his rejection or his acceptance, and the chairman of the interview team wrote a brief but global evaluation of the applicant's potential for academic success. After the applicant's "dossier" was thus complete, the director of admissions then made the final decision concerning the applicant's rejection or acceptance. If rejected, the applicant could, of course, appeal the decision. With the exception of SAT scores and high school averages, transfer students underwent the same admissions process.

Not the least of the requirements for admissions was the requirement that the applicant present two academic credits more than other colleges in the state then required. Also not the least of the requirements involved in the selective admissions program was that by the very nature of the selective admissions program, the applicant was required to visit the college on at least two separate occasions and usually three. He was required to make his application in sequence, sometimes being required to wait a considerable period of time between steps, but usually completing the admissions process, if all went smoothly, in about three weeks. Some faculty members at the college expressed the view that this must surely test the applicant's persistence; others thought it tested his sincerity about desiring a college education.

Qualitative Shifts In Academic Ability

Because the Otis Quick-Scoring Test of Mental Ability (the Otis Gamma) had been used in previous years for testing entering freshmen after they were enrolled, it was deemed desirable to include it in the battery administered to applicants, both at the entering freshman level and at the transfer level. A comparison of Otis I.Q. scores for entering freshmen who were admitted during the years 1952-54 has been made in Figure 1, with the scores for entering freshmen who were admitted during the years 1959-62, the first three academic years that the selective admissions program was in operation.

The overlapping distributions of Otis I.Q. scores show a substantial but not dramatic shift upward on the scale. The mean I.Q. for entering freshmen prior to selective admissions was 105.5, with a standard deviation of 10.2; the mean I.Q. for entering freshmen who had undergone the selective admissions program was 111.8, with a standard deviation of 8.5 points. The implications of the comparison, therefore, is that the entering freshmen who had been selectively admitted were somewhat better prepared for college work, in so far as the Otis Gamma measures such preparation, than their predecessors but they were not a great deal more homogeneous. The most significant aspects of the two distributions is not so much the increase in mean performance or the slight decrease in variation as it is the shift of the bulk of students from an I.Q. range of 95 to 110 to a range of 100 to 120. Whereas the entering freshmen admitted under an open-door policy were more similar in general intelligence to the general population, the selectively admitted freshmen were more similar to freshmen admitted to other institutions in the nation.

Perhaps a better comparison of "before and after" measures of academic ability can be gained from Table 1. There the SAT scores and high school averages were shown for two years prior to selective admissions and for four years following the initiation of the selective admissions program. As will be noted, neither the gains in measured academic ability nor the increase in high school averages are dramatic, considering the rigidity of the selective admissions process. While a rise in mean performance is readily detectable, the significance of the data is to be found in the exclusion of students in the lower brackets of verbal and mathematical ability and the somewhat gradual reduction of "C" average students admitted to the college. It is well to note, however, that the selective admissions program did not immediately place a larger proportion of entering freshmen in the upper brackets of verbal and mathematical ability. Rather the selective admissions program was in effect for two years before an actual gain at the upper levels (above 500) is in any way impressive. The failure to select a larger proportion of "A" average students over the six year period may be attributed to either "floating" standards in the high schools or to the attraction of students from different high schools.

Changes in Institutional Characteristics

The changes in admissions policies came at a time when numerous other policy and program changes were underway at the college. In 1957, both the Bachelor of Arts degree and the Bachelor of Science degree was authorized with majors in several fields. The School of Business was authorized to confer the Master of Business Administration degree and expanded greatly the scope of its offerings at the undergraduate level. In both the School of Business and the College of Arts and Sciences a major emphasis was placed on the raising of academic standards.

The expansion of the college's academic programs into the fields of arts and sciences and into the graduate level was a highly significant factor in changing both the institution's role and its image. Whereas previously the great majority of the students had been enrolled in business courses, the majority by 1960 enrolled in arts and sciences. And whereas the majority of students had been full-time employees who attended evening classes, the majority now became full-time students who moved directly from high school to enrollment in day classes. And whereas the majority of students had been males because of the limited offerings to females, the majority of entering freshmen were now females. Concurrent with these changes were a concerted effort to recruit and retain competent faculty members and a concern with new directions and new goals in general.

Figure 1. Comparison of Otis IQ Scores for Entering Freshmen Before and After Initiation of Selective Admissions.

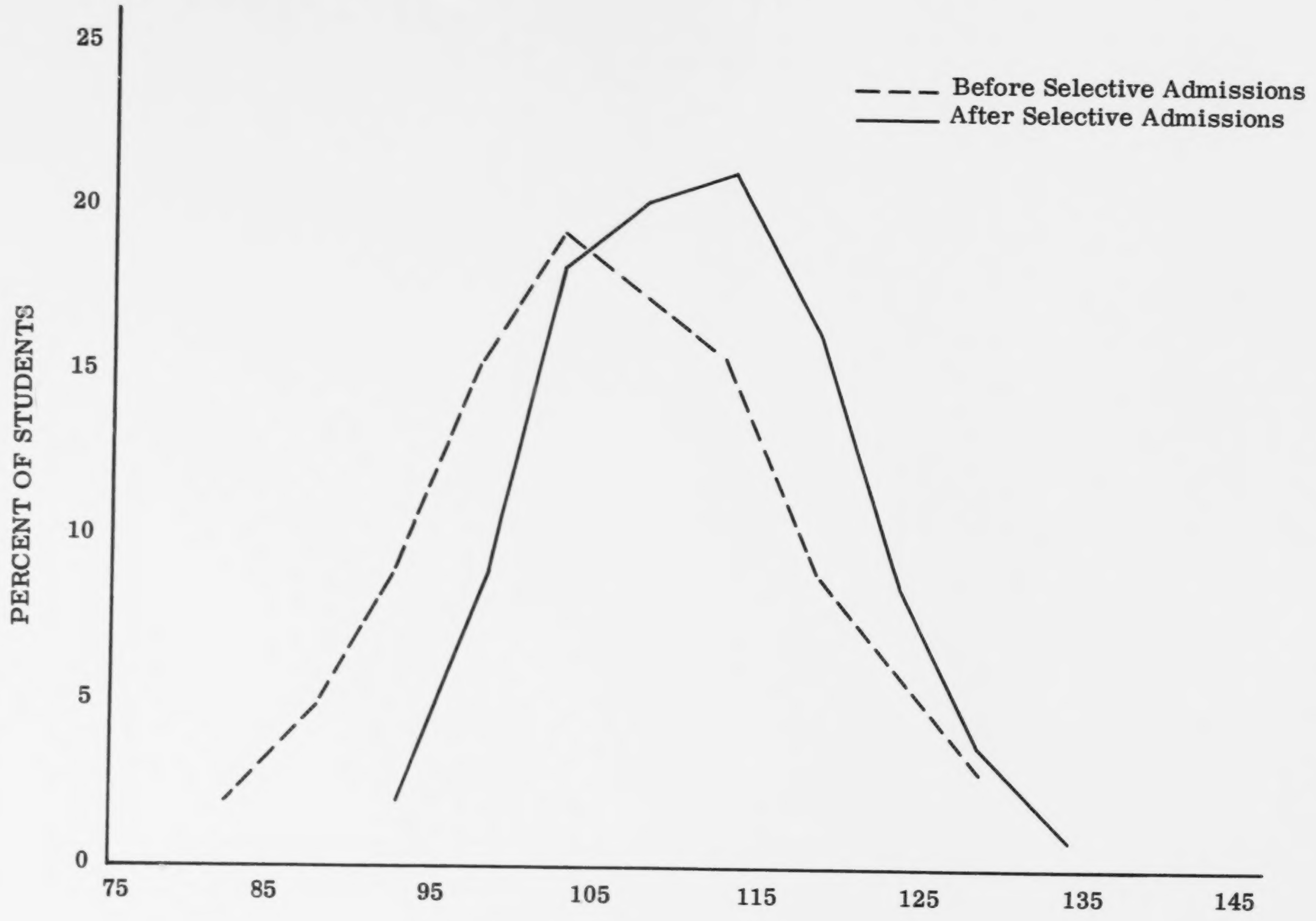

TABLE 1. DISTRIBUTION OF CEEB SCHOLASTIC APTITUDE TEST SCORES AND HIGH SCHOOL AVERAGES FOR ENTERING FRESHMEN OVER A SIX YEAR PERIOD[1]

	Percent of Entering Freshmen:					
	1957	1958	1959	1960	1961	1962
SAT - Verbal						
600 - 699	1	2	2	6	7	4
500 - 599	8	8	14	21	25	25
400 - 499	24	28	35	41	49	46
300 - 399	40	46	46	30	19	25
200 - 299	27	16	3	2		
SAT - Math						
600 - 699		1	3	3	2	4
500 - 599	9	10	12	20	26	26
400 - 499	31	36	43	46	52	46
300 - 399	44	45	39	29	20	24
200 - 299	16	8	3	2		
High School Average						
A	12	14	14	26	20	17
B	35	42	43	52	55	56
C	53	44	43	22	25	27
NUMBER	544[2]	713	254	306	294	396

1. All data given are for Fall Quarters
2. 192 excluded because of incomplete data

NOTE: The average Otis Intelligence Quotient during this period was raised from 105 to 113.

Outcomes and Results -- Although virtually impossible to relate to the selective admissions program, there are several outcomes and results which may be mentioned. The most immediate result of the selective admissions program was a drastic reduction in freshmen enrollment. Whereas the college has previously admitted around 1000 beginning students each fall (many of which were adult or special students and not included in Table 1.) the first years of selective admissions netted only 254 students. Other results or outcomes not so immediate was an increase in the holding power of students and an increase in the number of baccalaureate degrees awarded by the college.

Contrary to expectations, the selective admissions program did not produce a change in grading patterns. This is best illustrated by the fact that prior to selective admissions 54 percent of the entering freshmen failed to make a "C" average during their first quarter of enrollment. In the first year of selective admissions, 52 percent of the entering freshmen failed to make a "C" average; the second year those failing to make a "C" average had been reduced to 33 percent, but this percent was not reduced the following year, and four years after selective admissions it had risen back to 37 percent. In the meantime, the percent of first quarter freshmen making an average of "A" had remained constant at two or three percent, the same as before selective admissions.

Faculty Opinions and Attitudes -- The receptivity of the faculty to the selective admissions program was, for the most part, positive. Many faculty members believed strongly in the advisability of selective admissions and responded enthusiastically to the new policies. Some faculty members, however, were aware that the changing role of the college left a void in the areas of adult or community education and in certain areas of short-term vocational training; these faculty members thought that the college should continue to serve these community needs as well as to elevate its academic standards for degree-seeking students. The fact that a fairly large number of faculty members were paid an honorarium for interviewing students may have made the admissions program more palatable to some faculty members. In any event, there was considerable belief on the part of the faculty that they were actively involved in the admissions program.

Student perceptions -- Throughout the experience of institutional change, no effort was made to determine how students perceived the changes and whether they thought them for better or worse. Students who were admitted no doubt felt more charitable toward the admissions process they had undergone, but the impression of at least one faculty member is that most students met the changes in institutional characteristics much as they endured the admissions process -- with quiet resignation. Six years after the establishment of selective admissions, the responses of a group of student leaders on the College Characteristics Index indicated that the student leaders perceived the college as slightly oriented more to vocational preparation than to academic achievement.

The public image -- One of the most significant outcomes accompanying the selective admissions program was the noticeable change in the institution's reputation within the city. Whereas previously the college had been known as "a last resort" it now became known as a college that was "very difficult to get into." Fortunately, for the college, the public made the non sequitur of concluding that it must be a good college. For two or more years the college went into journalistic eclipse as far as the local newspapers were concerned. As memory blurred the abruptness of the new admissions policies and better evidence came to the foreground that the college had, indeed, succeeded in its efforts to change its role and its image, the college began to receive better coverage in the newspapers.

Evaluation and Conclusions

There can be no doubt that within a ten year period this college succeeded in changing radically both its role and its image. It would be a mistake, however, to conclude that selective admissions was the major factor involved. It must be remembered that academic standards at the institution had been rising for at least ten years prior to the establishment of selective admissions, and that the college had been making continuous, even if somewhat uneven, progress since World War II. The location of the college in the midst of a thriving metropolitan area suggests a certain amount of inevitability about its growth and development. The changing demands being placed upon higher education in general also made the changing role of the institution, to some extent, inevitable.

This is not to contend that the selective admissions program was without influence in changing institutional characteristics. It did make the student body younger by eliminating adult education courses and by relying so heavily upon tests which give the young high school graduate a certain advantage. It did, at least indirectly, contribute to the institution's public image by impressing upon applicants that their admission to the college could no longer be taken for granted.

Yet, there is good reason to believe that the selective admissions program at this particular college was, to a large extent, a vestibule operation which was little related to far more potent forces at work within the college and within the community it served. The expansion of curricular offerings in arts and sciences, and a general broadening of scope of all the institution's academic programs would seem to be potent forces in attracting better prepared students to the college. Expanded course offerings and better prepared students, in turn, attracted more students who would not have previously attended the institution and provided the impetus for further expansion of course offerings. Thus, it would seem that a "virtuous circle" was established which was, in no direct way, dependent upon selective admissions. It would appear, therefore, that only the admissions program was a rapid innovation. The changes in institutional characteristics accompanying selective admissions were quite gradual; these changes had begun before selective admissions and required almost ten years to actually effectuate.

The primary contention of this paper, therefore, is that selective admissions alone is not the solution to the problems confronting higher education. For some institutions selective admissions may produce dramatic changes in average test scores of entering students but for most public institutions, selective admissions is a necessary evil only and not a virtue. Its effectiveness must be judged in terms of educational values and purpose--not in terms of predictive efficiency. In short, admissions policies must be coordinated with an institution's academic policies. Being the necessary evil that it is, let us take care in selective admissions that we select students for the right purposes and in the right way.

"MOTIVATION", APTITUDE AND PERFORMANCE IN COLLEGE AN INSTITUTIONAL "MICRO-ANALYSIS"

Irma T. Halfter
De Paul University
Chicago

In 1961 the University began a continuing, intensive study, to determine the "goodness of fit" between students attracted and selected and university goals and objectives. The primary question was should the University proceed to "greater" selectivity and/or to new conceptualizations of educational programs? The findings from the five-year project have produced new guidelines for curricular design for all colleges and the university, now being implemented structurally by a new college, divisional organization, and unified "liberal" programs of studies for all students.

The University will continue to select students with characteristics similar to those in the past and will experiment with educational programs for attracted-selected high aptitude students. On the basis of this experience, one may challenge the point that the goal of institutional research should be making an impact on higher education in general. Should not the primary purpose of institutional research be precisely that, micro-analysis, separate and distinct from the prevailing macro-analysis research in higher education?

Background for Study

The institution attracts predominantly middle-ability students, characterized by social mobility aspirations, two to three levels above the father's semi-skilled and skilled occupational level (Roe schema), and who enter with stated educational-vocational goals. Should such "motivation" be incorporated, then, into academic prediction formulae? Intellective predictors, such as aptitude scores and indices of previous high school achievement, continue, however, to be the most effective in estimating performance in college (Fishman-Pasanella, Junius Davis); yet high school and college admissions counselors continue to prize "motivation": students with educational-vocational goals consistent with their aptitudes will be "motivated" to purposeful academic activity and satisfactory academic performance in the appropriately selected college.

On the other hand, non-intellective predictors (personality assessments, vocational interest inventories, biographical instruments and others) have resulted in an increment of only about .05 of the intellective. (Junius Davis, 1965) Yet a variety of "environmental" studies (Astin, Holland, Pace and Stern, Clarke and Trowe, Thirstlethwaite) open the possibility of discovering a relationship between vocational goals and college selection, majors in college, success in academic performance, and personal identity. The shortcomings of the studies are: (1) psychologizing of the social structure; (2) press for greater selectivity in admissions, through their criteria for what constitutes "intellectualism"; e.g. high mathematical aptitude scores characteristic of middle-class students. What is overlooked is that social mobility aspirations may be a powerful "motivating factor" for persistence and performance in college for the students described, particularly for men. These students' preference for an education must become an "economic choice", i.e. the foregoing of immediate full-time employment, required part-time employment, and perhaps discontinuity in time of attendance.

The career-guidance studies seemed to sanction the procedure in this study: accepting the student's directly stated expression of educational-vocational goal on admissions and registrations (rather than using instruments to determine occupational preferences). Limited rationality in decision-making was assumed. The question now was: Among these students did those having, in addition to having social mobility aspirations, the "motivating factor" of specific educational-vocational goals on entrance, differ in performance from those without such specific goals ("undecided"?) Were the differences, if any, in performance due to "motivation" or to level of ability?

"Motivated" students were defined, operationally, as entering with a specified academic major (or later switching to other academic majors) or a pre-professional program of studies (PPS), e.g. engineering, law, medical technology, and others. A "non-motivated" or "undecided" student was defined as one having no academic major or interest in a professional program of studies on entrance. Such a student would be at odds, it was presumed, with the prevailing student culture.

Design

The variables were College Board scores, verbal and mathematical, university and college of registration, sex. The dependent variable was cumulative grade-point average, end of freshman year. Appendix A describes (in abbreviated form) the sample and statistical techniques employed to test the null hypotheses of no difference in performance between "motivated" and "non-motivated" (undecided) students in the university. Similar analyses were made for men and for women in Liberal Arts and for men in the College of Commerce (no women registrants).

Findings and Conclusions

In the University, the adjusted mean grade-point of the motivated students were very significantly different from the mean grade-point of the non-motivated (undecided) students, after adjustment for either verbal or mathematical aptitude. In De Paul University the verbal aptitude score has three times the weight of the mathematical score in the multiple R utilized for estimating the future performance in the university of entering freshmen. In Liberal Arts, among men, the motivated men with an academic major on entrance had significantly higher grade-point average than non-motivated men (when aptitude, verbal or mathematical was partialed out). For women no significant differences appeared between or among the three categories (major, PPS, or undecided). This suggests, again, sex should probably always be employed as a moderator variable.

The finding suggests that the social mobility goal is a motivating factor for men but not for women (perhaps women marry the socially-economically upwardly mobile men!). In the College of Commerce, the undecided group, on entrance the highest verbal aptitude scoring group, earned below a 2:00 grade-point average (after adjustment for verbal aptitude). After adjustment for mathematical aptitude, the interaction among motivation, mathematical aptitude, and performance is less clear for Commerce men than for university men in general, although the undecided among Commerce men differed very significantly in performance from one of the motivated groups in Commerce. Persistence, in another study, was shown to be significantly greater for motivated than non-motivated men; that is, movement out of a major or PPS in freshman or sophomore years into another major resulted in greater persistence than when movement occurred from motivated into non-motivated groups (when aptitude was partialled out). The finding was particularly striking among Commerce men. Because both studies oversimplify the variables involved, a complex longitudinal design is now being constructed, involving these and some 24 other variables.

Tentative Implications

Having an educational-vocational goal will apparently be a factor in satisfactory academic performance for the men students described. The "undecided" students described should apparently receive special guidance in goal setting and its significance from high school and college counselors, if they attend a college or university of the kind described, with a student population characterized by social mobility aspirations expressed in at least tentative educational-vocational goals. For the male students described the selection of such a college as a time and place for first making up one's mind may be suspect, even in Liberal Arts.

The findings do not dispute that educational-vocational decision-making in college should be a continuous choice-process but warrant the hypothesis that changes should probably be from one goal-directed activity to another goal-directed activity, and that the college chosen should provide this range of opportunities as congruence occurs between aspirations and aptitudes and interests. Perhaps one can say: Better to choose and change than not to choose at all. Psychologically it can presumably be demonstrated the anxieties and ambiguities associated with no-choice may be disruptive for performance for male students in the college described. Such a premise assumes both student and college will exhibit the trait of flexibility. The limitations of the study are obvious: over-simplified design, no cross-validation (as yet), replication of similar studies in urban, commuting universities, with similar student bodies, if micro-analysis is to contribute to macroanalysis.

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APPENDIX A

COVARIANCE ANALYSIS

Entering 1961 Freshmen, De Paul University, Chicago, Illinois

A. VERBAL APTITUDE AND PERFORMANCE - "MOTIVATED" AND "NON-MOTIVATED"

		N			F-test			t-test	
	M	PPP	U	Verbal Means	Unadjusted GPA Means	Adjusted GPA Means	Mean Major-Mean PPP	Mean Major-Mean Undecided	Mean PPP-Mean Undecided
Total De Paul	397	79	77	0.088	4.486*	5.592**	3.847	22.272**	18.425**
Liberal Arts Men	124	44	34	2.014	2.479	2.002	10.406	19.347*	8.941
Liberal Arts Women	140	12	21	1.219	1.666	0.803	6.934	15.035	8.101
Commerce Men	133	23	22	3.300*	2.978	3.698*	-12.430	30.004*	42.434**

B. MATHEMATICAL APTITUDE AND PERFORMANCE - "MOTIVATED" AND "NON-MOTIVATED"

		N			F-test			t-test	
	M	PPP	U	Verbal Means	Unadjusted GPA Means	Adjusted GPA Means	Mean Major-Mean PPP	Mean Major-Mean Undecided	Mean PPP-Mean Undecided
Total De Paul	397	79	77	1.963	4.486*	5.128**	7.834	21.651**	13.817*
Liberal Arts Men	124	44	34	0.005	2.479	2.558	15.965	19.585*	3.620
Liberal Arts Women	140	12	21	1.292	1.666	2.575	15.602	27.979	12.377
Commerce Men	133	23	22	1.045	2.978	2.224	-17.374	17.338	34.712

* significant at .05
** significant at .01

"Motivated"= M, academic major or PPP, pre-professional program at time of entrance

"Non-motivated" = U, no specific educational-vocational goal at entrance

Aptitude = College Entrance Examination Board SAT test: verbal, mathematical

GPA = Earned first-year grade-point average

ENVIRONMENTAL PRESS PREFERENCES OF STUDENTS

Vernon L. Hendrix
University of Minnesota

Within recent years much interest has been exhibited in the measurement of college environments. The College Characteristics Index, (CCI), developed by Pace and Stern, was one of the first instruments to be developed. The CCI attempts to measure the environmental press of an institution upon its students in terms of 30 dimensions roughly equivalent to the 30 "needs" measured by the Stern Activities Index (Stern, 1963). Taking a different approach, Pace (1963) developed the College and University Environment Scales. These scales identify the major dimensions along which institutions differ, rather than the ways in which individuals perceive institutions. The basic difference between these two approaches lies in Pace's contention that there is no reason to expect the dimensions which characterize individual institutions to be congruent with the dimensions which characterize individual students (as might be measured by the AI or other personality instruments).

One central issue is quite critical to both of these approaches. To what extent are student perceptions of the college environment actually independent of student personality characteristics? In Murray's terms (1938), to what extent can the alpha press be separated from the beta press? Several studies and arguments have been placed in evidence to indicate that student perceptions are in fact independent of student characteristics, at least as far as these instruments are concerned. Stern, in his chapter in The American College (Stern, 1962 A), states that the description of the college is apparently not a function of the students' self-description. Pace (1963) presents additional arguments based upon the techniques of opinion polling. Both Stern (1963) and Pace (1963) list many individual studies that pertain to this problem. McFee's (1961) and Stern's (1962 B) are often cited. In addition, three unpublished dissertations have been completed at UCLA which indicate that student perceptions and student characteristics are apparently unrelated.

James V. Mitchell, of the University of Rochester, presented a paper at the AERA meetings (1966) which took exception to this alleged independence. Using various personality measures and the High School Characteristics Index (Stern, 1963), he demonstrated quite significant relationships among these dimensions for the students in a suburban high school. Since his study was at the high school level and concerned only one institution, it is not directly comparable with many of the studies indicating independence of perception and characteristics, but at least it raises some questions.

Another problem associated with the measurement of college environments relates to the practical application of information. For example, what decisions can be made? How can students be most effectively "matched" with colleges? What changes can be made in the environment? How shall these changes be initiated? How can symptoms (which are actually what students are reporting in these instruments) be related to underlying causes? How can the effects of changes be predicted?

This paper reports part of a pilot attempt to develop a method of avoiding the first problem (independence of perceptions and characteristics) and of permitting a rather direct attack upon the second. Additional studies and techniques are proposed some of which are being expedited through projects funded by the U. S. Office of Education. Pace is currently conducting studies with other types of institutions. This pilot study deals entirely with public junior colleges. It seems safe to assume that the techniques, if successful at all, will be generalizable to a variety of situations.

There were 297 students from 20 public junior colleges in Minnesota, Texas, and California, who responded to the College Characteristics Index, to which were attached different instructions. The colleges were selected either because of availability or to permit the analysis of these data along with other data. No sampling design was considered. The students were selected within each college randomly.

The students were instructed to disregard whether a particular item was or was not true of the college they were attending. They then indicated, using a nine-point scale, the extent to which they would prefer or not prefer to be a student in an institution for which the statement was true. This scale ranged from: "I would definitely not prefer and/or would be extremely uncomfortable in a junior college characterized by this statement. It is completely incompatible with my ideal institution. The statement, if true, is so intolerable that I would probably go to another college." to "I would definitely prefer and/or would be very comfortable in a junior college characterized by this statement. It is an essential component of my ideal institutional environment. If not true, this would be intolerable and would probably cause me to go to another college."

The responses were scored using the regular CCI key. Preference for an item was associated with true, whereas rejection of an item was associated with false. These responses were then collapsed, according to the CCI scoring technique, into 30 scales. A student's score on one of these scales would then indicate the extent to which he preferred an environment characterized by abasement, aggression, etc. Principal component analyses were conducted using these 30 scores. Five unrotated dimensions were produced. Scores on each dimension were produced for each student (Cooley and Lohnes, 1962), and correlated with responses on individual items.

This resulted in a matrix of five columns and 300 rows. This rather rectangular matrix was then subjected to varimax rotation, permitting the identification of individual items which were most highly related to the dimensions for students. This procedure is, of course, not equivalent to discovering the basic dimensions which underlie the battery of 300 items, but roughly similar results would be expected for the first few dimensions to be extracted.

The results of this analysis for students yielded two factors, as three were destroyed during rotation. Considering the first factor, the negative direction of this dimension was characterized by preferences for environments in which proper social forms and manners are emphasized; students take pride in personal appearance and proper grooming; activities such as dancing and skating are enjoyed; poise and sophistication are respected; organizations are interested in charity; tutorial and honors programs are available; appropriate dress for different occasions such as gracious social occasions and dining, are thought about, drunkenness and disorderliness are rarely observed; pressures to "live up to a code" are exerted by students; and upper classmen play active roles in the adjustment of new students, etc. Loadings for these items summarized here and for others range from -.60 to -.99. Seven of the ten strongest loading items were associated with the CCI narcissism scale. In general, there seems to be expressed a preference for socially desirable and approved environments with indications of self-consciousness, self-interest, and self-improvement. Such a college would appear to be the ideal environment for producing cultured young men and women and might find its closest reality in the stereotyped concepts of some liberal arts colleges and New England finishing schools.

The positive direction on this first factor is characterized by preferences for environments in which students pay little attention to rules and regulations and make evident any dislike of faculty members; popular students have a knack for witty and sexy remarks; and escapades and rebellions are occasionally plotted. Dislikes are expressed for environments in which intramural and class rivalry get rough; most students have little interest in panels, discussions, etc.; drinking and late parties are tolerated; a student who insists on analyzing art is considered odd; the faculty seem to have little time for conversations with students; and modern art and music get little attention. Preferences for rebellion, independence, and directed disorderliness are indicated. Also, an avoidance of social and intellectual conservatism is expressed, along with preferences for intellectual and cultural activities of a stimulating nature. Desired interaction with faculty members is also apparent. The loadings for items descriptive of the positive direction on this dimension ranged from .40 to .60.

This first factor might then be named Social Conformity versus Social and Intellectual Independence and Stimulation. The most likely referrant for the positive end of the dimension could be found in some of the events that have characterized some large university campuses within recent years, particularly on the west coast. It should be added that these data were originally collected during the spring of 1964 before some of these events were given widespread treatment by news media. It is interesting to note that preferences for such activities were clearly evident in students in quite different kinds of environments before such widespread publicity could be said to have generated a demand for such things.

The negative direction on the second factor is characterized by preferences for an environment in which there are several popular spots where boys and girls may be found; nearly everyone has a date for weekends; students frequently go away for football games; student gathering places are usually active and noisy; there is lots of informal dating during the week; there are lots of colorful and lively dances, parties, social activities, parades, and carnivals; bermuda shorts, pin-up pictures, etc., are common; it's easy to get a group together for cards, etc.; students spend a lot of time together at the snack bar; there is lots of excitement and restlessness before holidays; there are many opportunities for students to get together in extracurricular activities; frequent informal social gatherings and big college events draw a lot of student enthusiasm and support. Loadings ranged from -.48 to -.74. Seven of the ten strongest loading items are from the sex-prudery scale of the CCI. Four other items are contained in the affiliation-rejection scale. Five items are from the Community scale in CUES. In general, this end of the dimension indicates a preference for a social, gregarious, friendly, environment. The appropriate stereotype might be the "rah, rah" type of college, in which socializing and dating are of at least equal importance with work and study. Some have indicated that this type of institution is declining in numbers and degree, but evidently there are still students who would prefer to operate in such an environment (Cutler, 1966). This dimension is probably unipolar. All items with loadings less than plus or minus .35 were not considered during this analysis since they could easily occur by chance. Only four positive loadings on this dimension exceeded this arbitrary cut-off, the greatest being .41. Examination of item content did not suggest a bipolar relationship with those items defining the negative dimension.

Roughly dichotomizing these two dimensions, we can identify four basic types of students, as indicated by their preferences. These would be students who: (1) prefer a more friendly, social atmosphere with conformity to social expectations and norms, (2) prefer a more social, friendly atmosphere with social, intellectual and cultural independence, rebellion and stimulation, (3) prefer a less friendly, social atmosphere with conformity to social expectations and norms, and (4) a less social, friendly atmosphere with social, intellectual and cultural rebellion, independence, and stimulation. Seeking brief labels for these four categories, one might use, respectively, gregarious-conservatives, gregarious-independents, loner-conservatives, and loner-independents.

Many scales in existing personality inventories might be expected to correlate with these categorizations by preference. Some studies are currently underway which will permit the examination of this question. More striking, however, are the dissimilarities between these preferences and those dimensions, developed by Pace in CUES, which seem to characterize most institutions. To be sure, the institutions used in this pilot study were junior colleges, whereas Pace's norm group consisted of four-year colleges and universities. Other pilot studies, however, have shown that the same dimensions, with only slight differences, probably characterize junior colleges. There are probably additional dimensions characterizing junior colleges, such as a "vocational-practicality" dimension in addition to the presently defined practicality dimension in CUES (Hendrix, 1964). Granted the basic dimensions along which colleges appear to differ, this implies that such differences are not strongly related to the dimensions along which students prefer or like colleges. No empirical test was made of this situation due to the small number of colleges and individuals for which data were available. Studies currently underway should provide some answers for this.

If college characteristics are not related to student preferences, this gives rise to a frustrating situation. This would seem to indicate that changes in the basic dimensions for colleges will not influence the extent to which students like or dislike colleges. This is perhaps saying that the ways in which a college can be changed cannot increase a student's liking for a college. This is, of course, more of a problem with public junior colleges than with selective admission four-year institutions. Highly able, highly motivated students in selective universities, for example, may "stick it out" even though they do not like the institution, until their educational or career goals are attained. Public junior colleges with "open door" admission policies are quite correctly considered failures if the students do not like the institution, since the student who does not like the institution will probably leave, and will abandon his educational or career objectives because other institutions probably are not available. The Community scale in CUES, which has five items in common with the second preference factor, is the most relevant dimension for such concerns currently available.

One of the problems mentioned in the introduction referred to the difficulty of matching students with colleges. Not enough information is available to indicate what happens when certain kinds of students are placed in certain kinds of colleges. Also, congruence between instruments which measure student characteristics and instruments which measure college characteristics has not been convincingly demonstrated, even with such apparently content congruent instruments as the AI and CCI. This pilot study lends further support to the argument that congruence is impossible and theoretically not to be expected.

It is proposed that a more highly developed and refined instrument, which will measure student preferences much in the way they have been measured in this pilot study, could provide an operational linkage between student characteristics (as might be determined by personality dimensions) and college characteristics (such as measured by CUES). Such an instrument can logically be related to personality measurements since in both cases the student is reporting about himself. Item parallelism, or item sub-group parallelism, such as now exists between the CCI and the AI, would not be required. In fact, personality instruments based on quite different theoretical grounds could be used.

The preference instrument could also be logically related to college dimensions, since the items would be identical with, or at least drawn from, the same basic pool of items, many of them being identical.

Operationally, this might proceed as follows. A sample of students (or a sample of potential students, high school seniors, applicants, or a sample from any other relevant population) would be given a battery of instruments to determine their characteristics along with a preference instrument. A correlation matrix could then be derived indicating in the usual manner the relationships among these various measures. Use of the preference instrument would also permit, for any given student or sample of students, the computation of differences between preferred environments and any particular college environment. By scoring the items both ways, statistics could be derived which would indicate the extent to which any given college environment differs from the environment a student has said he prefers. For example, if we assume that there are five dimensions which characterize colleges and two which characterize preferences, using the same battery of items, seven (difference scores) could be obtained. These difference scores are, of course, exactly determined by the actual environment scores and the preferred environment scores. Any two of the scores permits an exact determination of the third. Therefore, for a sample of students, knowledge of their preference scores and difference scores automatically and mathematically implies the environment. Thus, given three batteries of scores on students (preferences, differences, and, e.g., personality measurements) all of the information available mathematically is present. By a variety of techniques such questions as the following could then be asked: What relationships exist between environments and preferences? Between preferences and personality measurements? Between environments and personality measurements? Given available criterion measures that are to be maximized or minimized, such questions as the following might be asked: For a given college environment, what type of student would most likely result in the desired criterion measure? Given a particular student, what kind of college environment might he be placed in to increase the likelihood of the desired outcomes? In all of these cases certain controls could be established. For example, if a given college with certain characteristics wishes to change its student body characteristics to achieve certain changes in a criterion measure, it would necessarily have to account for the extent to which the student body changes would also alter the environment.

All of this, of course, is pure conjecture. Within a few months, however, data will be available to begin the empirical examination of some of these questions.

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EDUCATIONAL OBJECTIVES OF LIBERAL ARTS STUDENTS

Joseph C. Heston
Albion College

What do freshmen expect from their college experience? Which objectives rate as most important? Do various subgroups have similar or diverse patterns? How do stated objectives relate to later academic performance? Some answers may be found in this exploratory study based on data secured from the 481 freshmen entering Albion College in September 1965. This preliminary paper covers performance only through their initial semester in college.

Procedure

The instrument used is the "Objectives Questionnaire," slightly expanded from one developed at Michigan State University by Kidd, Warrington, Jackson, and Dressel (cf. J. Higher Educ., April, 1954). They used the instrument to measure attitudes toward general education after several terms of college attendance. Our version consists of thirty possible objectives that may apply to various courses and/or experiences in college as the incoming student anticipates them. These objectives are reproduced verbatim in Table 1 below. Students expressed their opinions (of the objectives) in two ways.

First, each objective was rated on this three-point scale:

1. High importance (Essential this be achieved).
2. Average Importance (Desirable this be achieved).
3. Little Importance (Not too important this be achieved).

Second, the student chose the five objectives he felt most important and ranked these five in order of importance.

"Scoring" Methods

The resulting answers made it possible to "score" each objective in several ways to get an estimate of its perceived importance. After empirically trying our four different procedures with all our data we settled on two, the "Weighted" method and the "Choice" method:

(a) Weighted Score: The ratings (1-2-3) marked in the initial test situation were reversed so that "High Importance" counts 3 points, "Average Importance" is 2 points, and "Little Importance" receives only 1 point. Thus a maximum rating of 3.00 would be achieved if every one marked an item as having "High Importance." The "Weighted" score is the most accurate because it takes into account every student's judgment on each item, i.e., it utilizes all the data. It is also the most tedious to compute and is time-consuming unless one has a computer or an electronic scoring machine.

(b) Main Choice Score: This is the number of times an objective is chosen as any one of the five most important. This approach is simple because it can be done quickly on an IBM sorter and requires no weighted computations. For our entire sample, the simple counting of choices correlated .991 with a system using the numerical values of the five different ranked choices.

The two scoring methods, "Weighted" and "Main Choice," correlated .705, so the quicker "Main Choice" method is not a completely equivalent substitute for the more tedious "Weighted" method. Table 2 shows how they differ. However, for the breakdowns into subgroups, the "Main Choice" method is utilized as the quickest estimate of group trends.

Data on the Class as a Whole: Weighted Scoring

Using the "Weighted" scoring, the data in Table 1 show the relative strength of the thirty objectives for all the freshmen, men and women. The strongest objective, No. 4, has a mean weight of 2.87, which is 96 per cent of the possible maximum (3.00). The least important objective, No. 29, is rated 1.65, or only 57 per cent as strong as No. 4. The average weighted score for all items combined is 2.427, or 80.9 per cent of the maximum. Thus, on the hypothetical "typical" item, nearly half mark it "High Importance," a similar number mark it "Average Importance," and a very small number rate it "Little Importance." It takes a rating of 2.64 to place in the top quarter of importance, while a rating of less than 2.30 falls in the lowest quarter.

TABLE 1. Weighted Scores of the Thirty Objectives as Rated by 481 Freshman Men and Women

Object No.	Statement of Objective	Mean Weighted Score	% of Maximum	Rank
1.	To master a classification of knowledge in a field.	2.48	83	16
2.	To master certain techniques applicable to one's vocation or field of special interest.	2.84	95	2
3.	To acquire specific information and techniques in preparation for further study.	2.57	86	11
4.	To acquire and use the skills and habits involved in critical and constructive thinking.	2.87	96	1
5.	To develop a code of behavior based on democratic and ethical principles.	2.50	83	14
6.	To express one's thought effectively.	2.83	94	3
7.	To recognize the fact of world interdependence.	2.13	71	26
8.	To learn to get along with people.	2.70	90	6
9.	To acquire a degree of expertness in a special field.	2.49	83	15
10.	To experience a realistic sampling of one's chosen vocation.	2.52	84	12
11.	To attain a satisfactory emotional and social adjustment.	2.62	87	9
12.	To understand other cultures and people.	2.42	81	19
13.	To know the major developments in a vocational field or field of special interest.	2.35	78	20
14.	To become acquainted with new points of view which may challenge and test my present beliefs and values.	2.65	88	7
15.	To habitually apply scientific thought to the discovery of facts.	2.05	68	28

TABLE 1. (continued)

Object No.	Statement of Objective	Mean Weighted Score	% of Maximum	Rank
16.	To bring up to date one's knowledge in a special field of interest or vocational field.	2.51	84	13
17.	To become proficient in one's chosen field of work.	2.75	92	4
18.	To understand and enjoy literature, art, and music.	2.21	74	24
19.	To understand one's physical and social environment.	2.42	81	18
20.	To develop certain manual skills.	1.74	58	29
21.	To move smoothly from high school to adult independence.	2.33	78	22
22.	To develop a broad general outlook and familiarity with a variety of subjects.	2.58	86	10
23.	To develop knowledge and understanding making possible a more effective choice of one's life work.	2.72	91	5
24.	To acquire knowledge and attitudes basic to a satisfying family life.	2.33	78	21
25.	To develop the ability to do significant independent research.	2.27	76	23
26.	To maintain and improve one's own health.	2.06	69	27
27.	To develop a philosophy of life adequate for the twentieth century.	2.42	81	17
28.	To acquire an appreciation for the intrinsic value of education regardless of the practical application it may or may not have to one's chosen vocation or profession.	2.19	73	25
29.	To find a suitable mate.	1.65	55	30
30.	To become more critical of one's self, one's values, and one's world.	2.62	87	8

Data on the Class as a Whole: Main Choice Scoring

What change in relative emphasis occurs when the "Main Choice" method is used? Obviously, if certain choices predominate, then a greater spread of scores will ensue from this method. This means there will likely be a wider differentiation between strongest and weakest objectives. But will this method produce any noteworthy change as to which objectives get the higher and lower votes? Table 2 presents in the first column the number of time each objective was chosen as "one of the five most important." In the second column each number is expressed as per cent of 481, the maximum possible number of choices. Because each student could make only five choices out of the thirty items, the pure chance factor for any item reduces to one sixth, or 16.6 per cent, which is the mean of column two. Columns three and four compare the rank earned by each objective in this Choice method with the rank from Table 1 when the Weighted method was used.

TABLE 2. "Main Choice" Scores of the Ojbectives as Rated by the 481 Freshmen

Object No.	Number Main Choices	% of Maximum	Rank Main Choice	Rank in Table 1*
1.	42	9	20	16
2.	73	15	13	2
3.	44	9	18	11
4.	181	38	4	1
5.	81	17	12	14
6.	205	43	2	3
7.	17	4	28	26
8.	148	31	7	6
9.	69	14	14	15
10.	31	6	24	12
11.	108	22	9	9
12.	84	17	11	19
13.	21	4	26	20
14.	189	39	3	7
15.	12	2	29	28
16.	29	6	25	13
17.	159	33	5	4
18.	50	10	16	24
19.	41	9	21	18
20.	5	1	30	29
21.	43	9	19	22
22.	151	31	6	10
23.	115	24	8	5
24.	52	11	15	21
25.	33	7	23	23
26.	18	4	27	27
27.	101	21	10	17
28.	47	10	17	25
29.	39	8	22	30
30.	209	43	1	8
Mean	79.9	16.6		

* Weighted Method

The objectives ranked 1 through 6 by the Main Choice method were formerly ranked 8, 3, 7, 1, 4, and 10 respectively -- all in the top third by the Weighted method. Those ranked 25 through 30 by Main Choice were formerly ranked 13, 20, 27, 26, 28, 29 -- all but one in the lower third by the Weighted method. The two methods correlate only .705, but in general agree on rough ranking of most of the objectives. The Main Choice method of scoring is more sensitive and effective insofar as it yields a proportionally greater range between maximal and minimal objectives.

Significant Differences in Subgroups

On which objectives do contrasted subgroups differ? How many statistically significant differences are there? We made eight breakdowns into sixteen subgroups. All these except (a) Sex, (g) Father's occupation, and (h) Scholarships were separated into "high" vs. "low" groups, with a middle or neutral group omitted, to emphasize the dichotomy in the factors.

The per cent of "main choice" responses to every objective was computed for each subgroup. The "t" ratio technique was used to determine the significance of observed differences. In the 240 pairs compared, there were 30 significant "t" ratios. These significant differences (i.e., t = 1.96 or better), detailed in Table 3, were found largely for only three of the eight factors compared -- sex, SAT Verbal, and Inventory of Beliefs.

Development of "Vocational" and "Educational-Cultural" Scales

The items may be grouped into two main scales or categories, "Vocational" items vs. "Educational-Cultural" items. Eleven items (#1, 2, 3, 9, 10, 13, 16, 17, 20, 23, and 25) comprise the Vocational scale. Fourteen items (#4, 5, 6, 7, 8, 12, 14, 15, 18, 19, 22, 27, 28, and 30) make up the Educational-Cultural scale. Keys punched to count only the "1" answers ("High Importance") were used to score these two scales. It was felt the sum of "1" answers to similar items would be a more stable description of a student's basic pattern of objectives than any single item response. Without formulating concise hypotheses, we were looking for possible significant differences between the sexes and between high and low academic achievers. We also wished to explore differences on some half-dozen ability and performance variables when high vs. low groups from these two scales were contrasted with each other.

As shown in Table 4, the two "scales," while differing largely in basic content, still correlate fairly significantly. For men (N=237) they correlate .345 and for women (N=235) the correlation is .295. Further, as will be seen in Table 5, groups selected as high vs. low on one scale will likewise be contrasted in the same direction on the other scale. All this may merely imply that some students have a generalized tendency to rate all objectives as more important, while others may be more restricted in their use of "high importance" ratings.

Table 4 gives the correlations of the two scales with 11 other variables. The top half of Table 4 gives correlations separately for the two sexes. The lower half is based on a combined group (N=102) and relates the objectives scales to five scales from Fricke's OAIS test. For the top half, a correlation of .130 is needed to be significant at the .05 level. In the OAIS section, a correlation of .195 is required at the .05 level.

In general, for both sexes the trend is toward negative correlation between the Vocational scale and the six measures of ability and academic performance. On the other hand, positive relationships tend to exist between Educational - Cultural items and the ability tests. None of the correlations appears likely to be useful as an added predictor in forecasting college achievement, but a multiple regression approach has not yet been tried.

For the OAIS scales, few of the correlations even approach significance. Educational - Cultural's plus correlation with Intellectual Quality and minus correlation with Business Interest are in the anticipated directions. Failure to get usable correlations with Achiever Personality was somewhat disappointing. In several studies, the Achiever Personality scale has given correlations of .40 - .45 with Albion GPA's.

To study the two objectives scales further, we set up contrasting high and low quarter groups on each scale. Each quarter had 120 students, the 60 highest (or lowest) men and a similar 60 women. Table 5 presents the means on the ability-performance measures for the high and low quarters of the objectives scales and the "t"- ratio for the difference between means. The obtained differences are in the directions predictable from the correlations. Here, though, the differences have been maximized by using only the extreme quarters. In general, higher ability

TABLE 3. Summary of Significant "t" Ratios in Subgroup Comparisons

Factor	Object No.	Percentages		Difference	"t" ratio
(a) Sex		Men	Women		
	3	13	5	8	3.07
	5	20	13	7	2.04
	11	17	28	-11	2.91
	12	12	23	-11	3.21
	15	4	1	3	2.35
	20	2	0	2	2.21
	29	11	5	6	2.43
(b) SAT Verbal		Hi	Low		
	4	46	27	19	3.06
	8	21	37	-16	2.71
	12	21	11	10	2.08
	16	2	9	- 7	2.31
	17	25	38	-13	2.16
	26	1	8	- 7	2.79
	27	28	10	18	3.46
(c) SAT Math		Hi	Low		
	4	43	30	13	2.23
	15	4	0	4	2.38
(d) H. S. Rank		Hi	Low		
	8	25	43	-18	3.48
	11	25	15	10	2.16
	27	25	16	9	1.98
(e) Inventory of Beliefs		Hi	Low		
	4	45	29	16	2.81
	12	28	9	19	4.31
	14	48	28	20	3.49
	18	17	10	7	1.99
	21	5	15	-10	2.98
	24	6	16	-10	2.72
	27	28	16	12	2.51
	29	7	14	- 7	2.20
(f) Watson-Glaser Test		Hi	Low		
	20	3	0	3	2.55
	27	27	13	14	2.91
(g) Father's Occupation		Hi	Low		
	14	34	46	-12	2.09
(h) Scholarships					
		No significant "t" ratio			

TABLE 4. Correlations of Objectives Scales with Other Variables

Variable	Vocational Scale Men*	Vocational Scale Women**	Educational-Cultural Scale Men	Educational-Cultural Scale Women
SAT Verbal	-.171	-.133	.213	.082
SAT Math	-.079	-.141	.106	-.001
High School Rank	.094	.052	.187	.019
Watson-Glaser Test	-.076	-.177	.084	.053
Inventory of Beliefs	-.063	-.091	.227	.148
Grade-Point Average	-.101	.006	.117	.064
OAIS Scales:	Men + Women***		Men + Women	
Achiever Personality	.027		-.070	
Intellectual Personality	-.072		.167	
Masculine Orientation	.062		-.073	
Business Interest	.117		-.193	
Humanities Interest	.001		.005	

* 237 Men
** 235 Women
*** Combined group of 40 Men and 62 Women

TABLE 5. Differences Between Means of High vs. Low Objectives Scale Groups

	High Quarter*	Low Quarter	t-Ratio
A. VOCATIONAL SCALE:			
SAT Verbal	531.7	553.7	2.14
SAT Math	564.4	589.7	2.15
Watson-Glaser Test	68.57	71.29	2.24
Inventory of Beliefs	71.33	72.48	0.67
Grade-Point Average	2.498	2.553	0.67
High School Rank	63.02	61.87	1.38
Vocational Scale	9.15	2.70	49.10
Educational-Cultural Scale	9.34	6.71	6.62
B. EDUCATIONAL-CULTURAL SCALE:			
SAT Verbal	547.2	527.4	1.75
SAT Math	573.5	558.8	1.21
Watson-Glaser Test	69.84	68.40	1.21
Inventory of Beliefs	73.66	68.07	3.26
Grade-Point Average	2.596	2.477	1.46
High School Rank	63.94	61.43	3.08
Vocational Scale	7.21	5.28	6.16
Educational-Cultural Scale	11.62	3.49	49.35

* Each quarter = Combined group of 60 Men + 60 Women

and/or performance scores are found in those low on Vocational and in students high on Educational-Cultural. High School Rank is the single exception insofar as it is higher for those high on either objective scale. This suggests that those who do well in high school are the ones who tend to mark more college objectives "High Importance," regardless of whether they are Vocational or Educational-Cultural.

Do subgroups differ on the two objectives scales? Table 6 shows the men higher on Vocational and the women higher on Educational-Cultural. The "t"-ratio is not significant for either difference, though it approaches the .05 level on the Educational-Cultural scale. When each sex is divided into upper and lower thirds based on college GPA, we get clearly significant differences on both scales for men and no significant differences for women. In all four comparisons the direction of difference is consistent with the trends in Tables 4 and 5.

TABLE 6. Differences Between Contrasted Groups on Objectives Scales

Groups Compared	Vocational Scale		Educational-Cultural Scale	
	Means	t - ratio	Means	t - ratio
242 Men	6.045	1.112	7.277	1.808
239 Women	5.791		7.803	
79 High GPA Men	5.430	2.225	7.861	2.207
79 Low GPA Men	6.329		6.671	
79 High GPA Women	5.759	0.207	7.747	0.836
79 Low GPA Women	5.835		7.380	

Item-Analysis of Objectives as Academic Predictors

Can individual items from the objectives list be useful prognosticators of college achievement? To pursue this, we computed "t"-ratios for each item when comparing high and low achievement groups. Men and women were treated separately. The upper and lower thirds of the GPA continuum for each sex were contrasted. The weighted method (3-2-1) was used in scoring each objective. As would be expected from Table 6, more "valid" items were found for men. For the men, six items reached a "t" value high enough for at least the .05 level. No items reached this .05 level for women. If in this preliminary exploration we lower our sights to the .10 level (where t = 1.64), there are 11 items that might be useful for predicting men's GPA and only 5 items equally valid for women. A cross-validation study is planned for the next freshman class, using a GPA prediction based on this current item-analysis. As viewed now, it does not appear particularly promising!

We shall conclude this paper with some empirical descriptions based on the item-analysis in Table 7. Reducing our requirements to the less rigorous 10% level to select items, high achieving men (as opposed to low achieving men) may be characterized as:

3. No so concerned about specific information and techniques.
13. No so concerned about major vocational information.
14. Looking for new and challenging points of view.
17. No so concerned about proficiency in chosen work.
18. Wanting to enjoy literature, art, and music.
19. Wanting to understand their environments.
20. No so concerned about manual skills.

TABLE 7. "T"-Ratios for Each Objective for High vs. Low Academic Performance Groups

Objective No.	(Entries are "t"-Ratios for mean differences) Men	Women
1.	-1.17	+0.43
2.	-1.34	+0.46
3.	-1.64	-1.06
4.	+0.64	+1.38
5.	+0.84	-0.91
6.	0.00	+1.86
7.	-1.16	+1.80
8.	-0.59	-0.17
9.	-0.27	+0.88
10.	0.00	-0.15
11.	+1.03	+0.82
12.	+0.99	0.00
13.	-2.25*	-0.92
14.	+2.01*	+1.05
15.	+0.35	+1.62
16.	-1.16	-0.31
17.	-2.87**	-0.18
18.	+3.69**	+1.85
19.	+1.90	-1.10
20.	-2.61**	-0.44
21.	-0.80	-0.66
22.	+0.28	-1.67
23.	+1.90	+0.18
24.	+0.83	-0.49
25.	-2.86**	-0.25
26.	-1.60	+0.12
27.	+0.85	+1.48
28.	+1.69	+0.67
29.	-1.78	-1.12
30.	+1.01	-0.30

* significant at .05 level
**significant at .01 level

Notes:

(a) Each column compares the high third vs. the low third on GPA. There are 79 cases in each third for each sex.

(b) A plus "t"-ratio indicates the high GPA group marked the objective more essential.

A minus "t"-ratio means the low GPA group considered the objective more essential.

23. Seeking better bases for choosing life work.
25. Not so interested in doing independent research.
28. Appreciating general values in education.
29. No so concerned about mate-seeking.

In the same manner, high achieving women may be described as:

6. Seeking to express thoughts well.
7. More interested in world interdependence.
15. Wanting to apply scientific thought to discovery of facts.
18. Wanting to enjoy literature, art, and music.
22. Not so concerned about broad general outlook.

Summary

Thirty objectives as rated by 481 entering college students were examined. Two methods of scoring were empirically compared. The capacity of the objectives items to differentiate various subgroups was tested. Two contrasting objectives scales were formed from the items. Although the scales were made from seemingly different item groups, the scales correlated more highly with each other (.30 - .35) than with any other variable used in the study. Individual items were analyzed as potential predictors of academic success. The single items and the objectives scales both demonstrated better statistical validity for men than for women. Few correlations are high enough to offer much promise in academic prediction. In general, items oriented toward vocational preparation show negative relations with measures of ability. Objectives of general educational and cultural development show positive correlations with measures of ability and academic performance. Students who do well, both in high school and in college, are more emphatic in rating both kinds of objectives higher.

DEVELOPMENT OF A SET OF GUIDELINES AND INFORMATION SOURCES FOR USE BY A FACULTY CURRICULUM COMMITTEE

H. R. Kells
State University of New York
at Binghamton

But for some discussion in McGrath's thought-provoking Memo to a College Faculty Member (1961), the literature is almost silent with respect to studies dealing with the effectiveness of and recommended procedures for a faculty curriculum committee. Despite the strategic position of the faculty curriculum committee for the formulation and maintenance of a sound and vital curriculum, which is responsive to the goals of the institution, and despite the consistent position taken by the teaching faculty that they "control the curriculum," it is not at all uncommon to find that this responsibility is not assumed fully by the curriculum committee --- curricula go unreviewed for years, catalogs are cluttered and often deceptively padded with courses long dead or unrealistically proclaimed and some curricula resemble fantastic "crazy quilts" which have developed unguided and unpruned and are surely most responsive to goals not always consistent with the goals of the institution.

During the past few months the question of the purposes of and procedures for a faculty curriculum committee has been the focus of some study by the institutional research effort at Binghamton. This was prompted by my recent two-year term on the faculty curriculum committee and, interestingly, in response to some genuine concerns by faculty members on our campus.

In the face of the usual gamut of opinions on the matter such as:

--course proliferation is not relevant
--the curriculum must grow as a school grows larger
--others should not doubt the opinion of an expert in a given field
--a committee should stipulate a maximum number of courses and allow a department to offer anything it chooses
--and even a strongly held opinion to abolish the committee

Serious reflection on the matter leads me to the conclusion that if it is to be believed that a given institution has a purpose and that the curriculum should uniquely satisfy this purpose; and if the faculty does not wish this curriculum to atrophy in part or emerge "like topsy," then the review of existing and proposed offerings in a logical and meaningful way cannot be relegated to others or neglected shamefully as is all too often the case.

This paper describes a general rationale and set of procedures which I have proposed for utilization on the Binghamton campus in the undergraduate liberal arts college, Harpur College.

Suggested Structure of a Faculty Curriculum Committee

Since it is maintained here that the curriculum committee must exercise an overview approach which considers the matters of curricular appropriateness and resource availability in studying questions of curriculum review and revision, the committee should be composed of:

1. Only tenured faculty (this point is heavily debated)
2. Members all of whom have been in residence at the college at least three years
3. A minimum of two faculty from each of the Divisions of study
4. The Dean of the College as a member present at all meetings
5. No department (or division) chairmen as members and possible conflicts of interest avoided in selection of members

6. Two non-voting staff people present at the meetings to act as resource people--the Associate Dean for Academic Advising (who presents the view of the student problems) and Director of Institutional Studies who is available to answer questions about institutional data.

General Procedures Employed and Background Materials Needed Before New Course Proposals are Considered

1. The curriculum committee should request each department to place on file with the committee a statement of the educational philosophy* of the department. This statement should show how the departmental goals are consistent with the goals of the college and should explain how the pattern of course offerings implement this program. For instance, the pattern of general or "core" courses and the scope and number of specialized courses should be adequately described.

2. The curriculum committee should spend at least three full meetings at the beginning of each academic year in discussing the purposes and procedures of the committee, in reviewing the departmental statements of purpose and the two-year plans of course offerings**, and in hearing presentations by the Dean and the Division chairmen about college and departmental curricular purposes, trends, weaknesses, and problems.

3. The departments should be informed of the procedures to be employed by the committee and should be requested to present the statements, plans and information desired before new course proposals may be considered.

Materials to be Supplied by the Office of Institutional Studies for Use by the Committee

1. A data sheet on each department including the following information: number of faculty, number of courses, number required, recent undergraduate and graduate student credit hour information, number of specialists (majors), size and extent of graduate program, a faculty subfield analysis (which subfields are well represented, which are not), extent of use of graduate assistants in teaching, extent of use of large lecture-type courses.

2. A three-year history of course offerings*** with enrollments by course and specific requirements for the specialization indicated.

3. A recent analysis of teaching load.**** Use of the faculty by type of use in each discipline, and student/faculty ratios should be included.

Procedures at the Time of Presentation of New Course Proposals Materials to be Supplied by the Department

In addition to the usual course description:

1. A statement explaining how the course proposal relates to and assumes a place in the departmental plan or pattern of course offerings on file with the committee.

2. A presentation showing exactly how the two-year plan of course offerings will be affected by the course proposal.

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* What is meant here is a general curricular rationale, design, goal or method of approach to a goal

** See sample two-year plan (Appendix A)

*** See three-year history (Appendix B)

**** See teaching load sheets (Appendices C and D)

3. A statement (with facts and figures) about how this proposal compares with curricula at other schools with respected departments in the field concerned.

4. A statement by the department chairman about ability to offer the course including expected frequency of offering.

Departments should be provided with the resources necessary to permit the expenditure of part of a faculty member's time to conduct in the summer preceding each regular academic year, in conjunction with the Department Chairman and the Office of Institutional Studies: a departmental curriculum review, a comparison of departmental offerings with offerings at other schools, an updating of the departmental two-year course plan, and the foundations for any new course proposals.

Guidelines for Committee Action on New Course Proposals

Based on information presented,

A. Appropriateness

1. Does the course proposal make sense in terms of the departmental plan or philosophy and course pattern on file with the committee? Is it a broad course or a very specific one? Does this addition overweigh either of the course-type categories?

2. How would the adoption of the proposal compare with curricula elsewhere? What are the reasons for conformity or lack of it?

3. What are the prerequisites? Stringent enough or too stringent?

4. How does the course proposal relate to offerings in other departments? Will it produce overlap or duplication? If so, is it justifiable?

5. Is the proposal well conceived, well developed, logical and reasonable?

B. Resources - Ability to Offer the Course(s) in Question

1. What effect will adding the course have upon the frequency of offering the other courses in the curriculum over the next two years? Will the department have to cut out some other course offering in order to offer the new course?

2. Are any of the present courses in danger of being dropped because they haven't been offered in two years (see below)? If so, how does the department plan to offer the new course? Is the general frequency of course offerings low? Is it time to drop a course?

3. How large is the total number of courses in comparison to the number required for the specialization? A useful danger signal is a ratio greater than 3/1. Only a department with an extremely high enrollment pressure and a high student/faculty ratio (much greater than the college average) can afford greater than 3/1, and even then one can still argue that a departmental curriculum with 35, 40 or more undergraduate courses, many of which are fairly specialized, is not consistent with either a liberal education or a coherent curriculum in a technical or professional school.

4. What is the student/faculty ratio (undergraduate teaching)? If the departmental ratio is substantially below the average for the college, then the committee must consider very carefully the effects of course additions in this department, for some other department will usually have to pay for them. (see Appendix E) This plot contains arbitrary cut-off points which demonstrate the resources balance between departments.

5. Is a present high student/faculty ratio being created by too great a reliance on massive lecture sections in all the first level courses, and is slack being created by very high usage of graduate assistants?

Are persuasive arguments under "appropriateness" able to be implemented with the "resources?"

In point B.2. above, I spoke of a two-year rule. A useful technique being employed at Binghamton is a faculty rule which states that if a course has not been offered in two years the department must convince the curriculum committee why it should not be dropped. If the committee agrees not to drop the course, the department has one more year to offer it or it is automatically dropped from the curriculum and must be reconsidered fully by the committee if it is to be offered again. One might call this the last resort procedure in curriculum review.

This, therefore, is the system proposed. It contains a review of the departmental curricular design, a review of existing courses, and consideration of new courses by criteria of appropriateness and resource availability. You will notice that although it contains "signals" and "flags" it employs few hard and fast rules. Judgment still prevails, but the possibility of enlightened considerations is enhanced. Institutional studies as a source of information for decision-making are the key to the system. Implementation of a program such as this is guaranteed to displease some faculty, for the laissez faire attitude regarding curriculum review which is generally found on the campus today is not consistent with this approach. Frankly, this matter is still being considered on our campus. I am pleased that it is being fully considered--that is half the battle.

REFERENCE

McGrath, Earl J., Memo to a College Faculty Member, Columbia University, 1961.

APPENDIX A

State University of New York at Binghamton June 1965

TWO-YEAR PLAN OF COURSE OFFERINGS

*This list is tentative and is subject to change; however, it does represent the latest plans formulated from available information and is provided to facilitate student planning.

DEPT. OR AREA Geology

DIVISION Science and Mathematics

Comments on the schedule are welcome and should be directed to the division or department office involved.

NOTES: "X" = plan to offer, no information on number of sections. Numbers represent probable number of sections.

		Year	1965-66			1966-67		
		Trimester	J	N	M	J	N	M
1.	101	Principles of Geology	3		X	X	X	X
2.	111	Physical Geology		3	X		X	X
3.	122	Mineralogy	1	X	X		X	
4.	124	Structural Geology			X			X
5.	126	Paleontology		X			X	
6.	142	Petrology		X	X			X
7.	144	Geomorphology					X	
8.	145	Field Geology	1			X		
9.	146	Stratigraphy		X				
10.	175-176	Independent Work	X	X	X	X	X	X
11.	232	Principles of Paleoecology		X			X	
12.	242	Petrography and Petrogenesis						
13.	245	Principles of Geochemistry		X				
14.	246	Principles of Geophysics			X			
15.	248	Sedimentation			X			
16.	270	Historical Geology			X			X
17.								
18.	311	Advanced Geomorphology					X	
19.	321	Advanced Geomorphology			X			X
20.	332	Advanced Mineralogy			X			
21.	331	Advanced Mineralogy			X			
22.	332	Advanced Stratigraphy		X				
23.	333	Advanced Paleontology II						X
24.	334	Advanced Stratigraphy II					X	
25.	341	Advanced Structural Geology		X				
26.	342	Advanced Structural Geology					X	
27.	397	Seminar		X	X		X	X
28.	399	Research	1	X	X	X	X	X

NOTE: One more 100 level course determined by student demand will be offered in July 1966.

APPENDIX B

State University of New York at Binghamton
Office of the Vice President for Academic Affairs

CURRICULUM ANALYSIS

Course Area Chemistry (page 1 of 1)
Department Chemistry
Division Science & Mathematics

Notes:
R = required
X = not in the curriculum
O = offered but at final regis. enrollment= O

Course No.		(R) Requirement Data	No. of Current Courses	History of Offerings and Enrollments								
				1963-4			1964-5			1965-6		
				7/63	11/63	3/64	7/64	11/64	3/65	7/65	11/65	3/66
111	General Chemistry	R	1	82	105	38	52	96	39	55	110	53
112	General Chemistry	1 R	1		40	74	14	40	46	9	41	55
113	General Chemistry-Adv.		1	X	X	X		16			13	
121	Analytical Chemistry (Lecture)	R	1		37		9		39		17	27
121A	Analytical Chemistry (Laboratory)	R	1/2	X	X	X	X	X	X	12	17	22
131	Organic Chemistry	R	1		80		11	78	19	13	55	
132	Organic Chemistry	R	1			69			63		24	41
151	Physical Chemistry	R	1		20			33			28	
152	Physical Chemistry	R	1			19			29			21
151A	Experimental Physical Chemistry	R	1/2		19			31				
152A	Experimental Physical Chemistry	R	1/2			17			28			18
175	Independent Work		1/2 - 1		7	8	3	11	7	1	3	5
197	Chemistry Seminar	R	1/4		19			22			23	
198	Chemistry Seminar	R	1/4			14			24			20
222	Instrumental Analysis		1			5						8
223	Analytical Separation Methods		1	X	X	X	X	X	X			
233	Organic Qualitative Analysis		1								9	
234	Organic Syntheses		1		6			1				
241	Inorganic Chemistry		1		13			14			6	
242	Inorganic Syntheses		1			6			3			2
251	Quantum Chemistry		1	X	X	X	X	X	4			8
122			-			28		23		X	X	X
254			-			8				X	X	X
111H			-		20					X	X	X
112H			-			11				X	X	X

Total courses	17 1/2 - 18
No. required for grad.	9

2-14-66

APPENDIX C

FACULTY TEACHING LOAD ANALYSIS

	Undergrad. Teaching Fac.*	Grad./ Teaching Faculty*	Assigned Research Faculty*	Admin. Faculty*	Other Duties Faculty*	Total "Instructional" Faculty* (3Div.)
HUMANITIES						
Arabic	.33	----	.33	----	----	.66
Art	5.50 (.67)**	1.42	.17	.25	----	7.34
English	9.75 (.25)**	3.59	.42	1.00	.83	15.59
French	7.44 (1.00)**	1.31	.17	----	----	8.92
Gen. Lit.	3.00	.50	----	----	----	3.50
German	5.35 (2.08)**	1.49	.17	.42	----	7.43
Greek	.67	----	----	----	----	.67
Hebrew	.42	----	----	.33	----	.75
Italian	1.17	.17	----	1.00	----	2.34
Latin	1.67	----	----	----	----	1.67
Ling.	.33	----	----	----	----	.33
Lit. & Comp.	10.83 (2.00)**	----	----	----	----	10.83
Music	7.67	1.24	----	.33	1.58	10.82
Philosophy	7.81 (1.00)**	1.77	.33	.33	----	10.24
Rhetoric	2.00 (.33)**	----	----	----	----	2.00
Russian	2.83	----	.17	----	----	3.00
Spanish	3.60 (.33)**	.73	----	----	----	4.33
Theater	3.42	----	----	.17	.50	4.09
Hum. Div.	73.79 (7.66)**	12.22	1.76	3.83	2.91	94.51
SCI. & MATH.						
Biology	8.32 (1.87)**	2.01	1.27	1.00	----	12.60
Chemistry	7.42 (1.67)**	1.64	1.47	.67	----	11.20
Geology	2.98 (.87)**	1.75	.67	.47	----	5.87
Math.	8.27	.93	1.80	.33	----	11.33
Physics	2.73	1.20	1.67	1.60	----	7.20
Psychology	4.90 (.60)**	1.03	1.33	.60	----	7.86
Sci. & Math. Div.	34.62 (5.01)**	8.56	8.21	4.67	----	56.06
SOCIAL SCIENCE						
Accounting	2.70	.55	.17	.50	----	3.92
Anthropology	3.45	.88	.33	.50	----	5.16
Business Enterprise	1.35	1.32	.25	.17	----	3.09
Economics	4.65	2.04	.75	1.50	----	8.94
Geography	1.90	.02	----	.33	----	2.25
History	5.19 (.17)**	2.56	.42	.50	----	8.67
Political Science	8.65	1.10	.33	.67	----	10.75
Social Science	2.33	----	----	----	----	2.33
Sociology	5.68	.74	----	.50	----	6.92
Soc. Sci. Div.	35.90 (.17)**	9.21	2.25	4.67	----	52.03
TOTALS						
All College (3 Div.)	144.31 (12.84)**	29.99	12.22	13.17	2.91	202.60

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*Faculty loads as defined in the teaching load policy (the number of 12 credit hours or 15 contact hour--for science--loads).

*Figures in parentheses are faculty equivalents used as grad. asst's. and are included in the Undergraduate Teaching Faculty figures.

APPENDIX D

FACULTY TEACHING LOAD ANALYSIS

	Undergrad. Cred. Hours Produced	Graduate Cred. Hours Produced	(1) Total "Instructional" Student-Faculty Ratio (S/F)	(2) Undergrad. Teaching S/F Ratio	(3) Undergrad. Teaching +Assigned Research S/F Ratio	(4) Graduate Teaching S/F Ratio
HUMANITIES						
Arabic	48	---	4.5/1	9.1/1	4.5/1	-----
Art	1536	51	13.5/1	17.5/1	16.9/1	2.4/1
English	2070	336	9.7/1	13.3/1	12.7/1	6.2/1
French	1600	85	11.8/1	13.4/1	13.1/1	4.4/1
Gen. Lit.	1380	68	25.9/1	28.8/1	28.8/1	9.0/1
German	972	90	9.0/1	11.4/1	11.0/1	4.0/1
Greek	36	---	3.4/1	3.4/1	3.4/1	-----
Hebrew	40	---	3.3/1	6.0/1	6.0/1	-----
Italian	120	20	3.8/1	6.4/1	6.4/1	7.6/1
Latin	164	---	6.2/1	6.2/1	6.2/1	-----
Ling.	32	---	6.1/1	6.1/1	6.1/1	-----
Lit. & Comp.	2616	---	15.1/1	15.1/1	15.1/1	-----
Music	952	29	5.7/1	7.8/1	7.8/1	1.5/1
Philosophy	2168	57	13.6/1	17.3/1	16.6/1	2.1/1
Rhetoric	158	---	5.0/1	5.0/1	5.0/1	-----
Russian	374	---	7.8/1	8.3/1	7.8/1	-----
Spanish	650	15	9.6/1	11.3/1	11.3/1	1.4/1
Theater	754	---	11.5/1	13.8/1	13.8/1	-----
Hum. Div.	15670	751	10.9/1	13.3/1	13.0/1	4.1/1
SCI. & MATH.						
Biology	1877	93	9.8/1	14.1/1	12.2/1	3.1/1
Chemistry	1190	77	7.1/1	10.0/1	8.4/1	3.1/1
Geology	184	80	2.9/1	3.9/1	3.2/1	3.0/1
Math.	1460	40	8.3/1	11.0/1	9.1/1	2.9/1
Physics	568	45	5.3/1	13.0/1	8.1/1	2.5/1
Psychology	960	28	7.9/1	12.2/1	9.6/1	1.8/1
Sci. & Math. Div.	6239	363	7.4/1	11.3/1	9.1/1	2.8/1
SOCIAL SCIENCE						
Accounting	519	57	9.2/1	12.0/1	11.3/1	6.9/1
Anthropology	996	80	13.1/1	18.1/1	16.5/1	6.0/1
Business Enterprise	383	132	10.6/1	17.7/1	14.9/1	6.7/1
Economics	1129	212	9.5/1	15.2/1	13.1/1	6.9/1
Geography	504	6	14.2/1	16.6/1	16.6/1	20.0/1
History	1438	167	11.6/1	17.3/1	16.0/1	4.3/1
Political Science	2440	46	14.5/1	17.6/1	17.0/1	2.8/1
Social Science	500	---	13.4/1	13.4/1	13.4/1	-----
Sociology	1419	68	13.5/1	15.6/1	15.6/1	6.1/1
Soc. Sci. Div.	9328	768	12.0/1	16.2/1	15.3/1	5.6/1
TOTALS						
All College (3 Div.)	31237	1882	10.3/1	13.5/1	12.5/1	4.2/1

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(1) [No. undergrad. credit hours produced ÷ 16 (credit hrs./student)] + [No. grad. student credit hours produced ÷ 15 (credit hrs./student)] ÷ No. "Instructional" faculty.

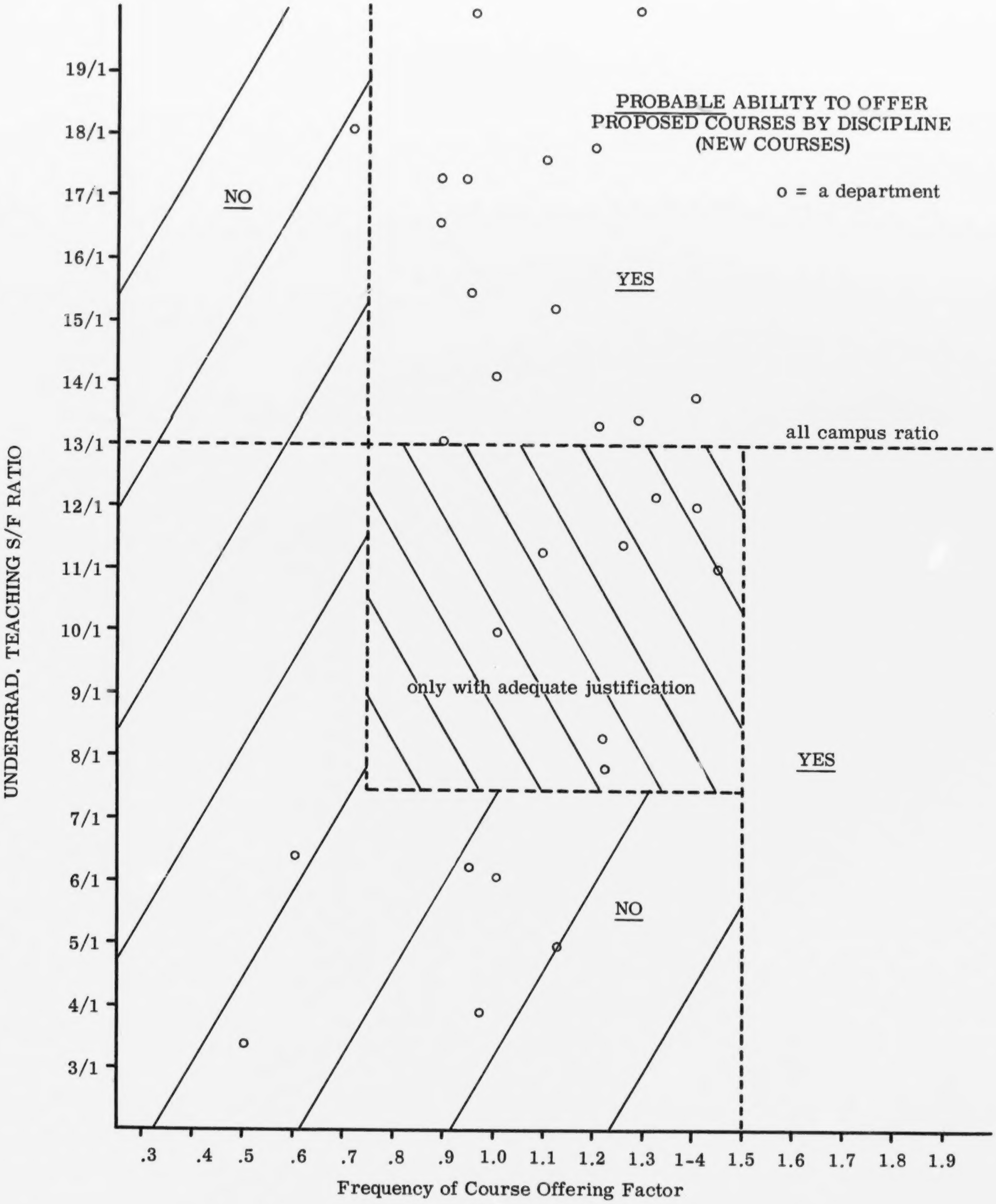
(2) No. undergrad. credit hours produced ÷ 16 (credit hrs./student) ÷ No. of undergrad. teaching faculty.

(3) [No. undergrad. cred. hrs. produced ÷ 16 (cred. hrs./stud.)] ÷ [No. undergrad. teach. fac. ÷ No. assigned research faculty)].

(4) [No. grad. credit hours produced ÷ 15 (credit hrs./student)] ÷ No. grad. teaching faculty.

APPENDIX E

April 1966



PROBABLE ABILITY TO OFFER PROPOSED COURSES BY DISCIPLINE (NEW COURSES)

$$\text{Ratio} = \frac{\text{No. times courses offered in Fall \& Spring}}{\text{No. actual courses in curriculum}}$$

AN IMPROVING HIGH SCHOOL RECORD: GOOD OMEN FOR COLLEGE?

P. Kenneth Morse
Eastern Michigan University

The assertion is frequently made that a total high school record is not as revealing as the last year or two years of that record. Those who support such a view frequently point to isolated cases of "late bloomers," who have suddenly developed from D students in high school to A or B students in college, and argue that this was predicted by their improvement in the last year or two in high school. Since Eastern Michigan University utilizes the high school average as a predictor variable for freshmen, it was deemed important to investigate empirically whether or not the last two years really do offer a superior prediction of college performance.

Sample and Procedure

The sample was composed of first-time freshmen who entered EMU, Spring 1960 through Fall 1961, from nine large-sending high schools. Only those persons were included in the sample who (a) had completed a semester at Eastern Michigan University and were charged with at least ten hours, (b) had a complete four year high school record with the total record obtained in the same school system, and (c) whose high school courses could be accurately assigned either to the first two years or the last two years.

For this sample, data on the following variables were computed or collected:

--GPA 9-10:	grade point average for the 9th and 10th grades
--GPA 11-12:	grade point average for the 11th and 12th grades
--HS GPA:	total high school average to date, computed from the transcript supplied with the application for admission. This average is based upon a minimum of 6 semesters.
--EMU GPA:	first semester grade point average at Eastern Michigan University

In compiling grade point average for high school, only those subjects were used which would receive academic honor points at E.M.U.

The sample was then divided into three groups:

(1) Late Bloomers (GPA 11-12 at least .5 greater than GPA 9-10)
(2) Early Bloomers (GPA 9-10 at least .5 greater than GPA 11-12)
(3) Steady Students (all who were not Early or Late Bloomers)

Using these criteria, 46 Late Bloomers, 76 Early Bloomers, and 283 Steady Students were identified.

Intercorrelations, means, and standard deviations were computed for the predictor and criterion variables for the entire sample and separately for each of three sub-groups. The EMU GPA of the three sub-groups was then compared using covariance analysis and controlling on HS GPA.

Findings

As indicated in Table 1, the Late Bloomers earned a higher mean EMU GPA than did the Early Bloomers (1.97 vs. 1.88) although their mean HS GPA was slightly lower (2.45 vs. 2.57). HS GPA exceeded EMU GPA by .69 for Early Bloomers, as compared to .48 for Late Bloomers and .45 for Steady Students. The success of Late Bloomers in college (1.97) is not commensurate with their late surge in high school (2.79), nor is the college record (1.88) of Early Bloomers anywhere near the promise of their first two years in high school (2.89).

TABLE 1. MEANS, STANDARD DEVIATIONS, AND INTERCORRELATIONS BETWEEN PREDICTOR AND CRITERION VARIABLES FOR 405 EMU FRESHMEN CLASSIFIED BY PATTERN OF HIGH SCHOOL RECORD

			Intercorrelations				
	Mean	S.D.	GPA 11-12	HS GPA	Gain	Sex	EMU GPA
Total Sample (N=405)							
GPA 9-10	2.62	.59	.68**	.91**	-.44**	.34**	.36**
GPA 11-12	2.53	.57		.86**	.35**	.45**	.46**
HS GPA	2.59	.53			-.04	.42**	.42**
Gain[1]	-.08	.46				.13**	.10*
Sex[2]	49.1% Male	-					.21**
EMU GPA	2.10	.74					-
Late Bloomers (N=46)							
GPA 9-10	2.14	.53	.96**	.91**	-.18	.60**	.37*
GPA 11-12	2.79	.52		.93**	.12	.65**	.41**
HS GPA	2.45	.50			.02	.59**	.45**
Gain[1]	.65	.16				.16	.12
Sex[2]	45.7% Male	-					.13
EMU GPA	1.97	.59					-
Early Bloomers (N=76)							
GPA 9-10	2.89	.47	.80**	.87**	-.42**	.25*	.33**
GPA 11-12	2.12	.44		.90**	.20	.20	.45**
HS GPA	2.57	.46			-.06	.34**	.42**
Gain[1]	-.77	.29				-.10	.14
Sex[2]	65.8% Male	-					.23*
EMU GPA	1.88	.75					-
Steady Students (N=283)							
GPA	2.62	.58	.91**	.96**	-.34**	.41**	.42**
GPA 11-12	2.60	.55		.94**	.09	.45**	.46**
HS GPA	2.62	.55			-.18**	.42**	.41**
Gain[1]	-.02	.24				.02	.04
Sex[2]	45.2% Male	-					.19**
EMU GPA	2.17	.74					-

1 GPA 11-12 minus GPA 9-10
2 Male = 1, Female = 2
* Significant at .05 level
**Significant at .01 level

Intercorrelations were computed between EMU GPA, the three high school measures, gain (GPA 11-12 minus GPA 9-10), and sex. For the total sample, GPA 11-12 was a slightly better predictor than HS GPA (.46 vs. .42), and significantly better (.05 level) than GPA 9-10 (.46 vs. .36).

Within the Late Bloomer group, the best predictor of first semester EMU performance is HS GPA. For the Steady Students GPA 11-12 is a slightly better predictor, although any of the high school measures could be used almost interchangeably. GPA 11-12 predicted best for the Early Bloomers, although HS GPA was almost as good.

We note in passing that the dichotomous sex variable is more strongly related to high school grades than to college grades. The relationship between sex and all three high school measures is strongest for Late Bloomers and weakest for Early Bloomers.

The academic folklore suggests that Late Bloomers are primarily boys who have belatedly awakened to a sense of responsibility and the Early Bloomers are girls who have belatedly discovered boys and the joy of social activity. For this sample, however, 56 per cent of the Late Bloomers were girls and 66 per cent of the Early Bloomers were boys. Clearly this finding does not square with the academic folklore.

Covariance analysis was performed, controlling for the effect of the total high school average. The results, shown in Table 2, indicate that the between-group differences were significant at the .01 level. After adjustment for HS GPA, the Steady Students still had the best EMU GPA with the Late Bloomers outperforming the Early Bloomers. With overall HS GPA equal, an improving record is better than a slumping record, but a consistent record is best of all.

TABLE 2. COVARIANCE ANALYSIS OF FIRST SEMESTER COLLEGE PERFORMANCE, WITH TOTAL HIGH SCHOOL AVERAGE CONTROLLED

Group	N	Total high school average Mean	S.D.	First semester college Mean	S.D.	Adjusted mean
Early Bloomers	76	2.57	.45	1.88	.75	1.89
Steady Students	283	2.62	.55	2.17	.74	2.16
Late Bloomers	46	2.45	.49	1.97	.59	2.05

Source of Variance	Sum of Squares High School	College	Sum of Products	Residual Squares	D.F.	Variance Estimates
Between	1.20	5.97	1.80	4.28	2	2.14
Within	111.27	213.23	63.99	176.43	401	.44
Total	112.47	219.20	65.79	180.71	403	

F 4.87, Significant at the .01 level

Discussion

An interesting finding is the small number (N 46) of Late Bloomers who met the definition used in this study (i.e., last two years at least .5 better than first two years). This finding is probably a function of admissions policy. Those schools which prefer an improving pattern will admit relatively greater numbers of Late Bloomers than those schools which stress the level of overall high school achievement.

Although GPA 11-12 predicted slightly better than HS GPA for the sample as a whole and for two of the sub-groups (Exception: Late Bloomers), the sub-situation of GPA 11-12 for HS GPA in the Eastern Michigan University admission process would not be warranted. Since the sample was originally admitted utilizing HS GPA as a predictor, variability on HS GPA would be more restricted than on GPA 11-12, and hence a slightly higher correlation for GPA 11-12 in the selected sample should not be equated with beter prediction in the unselected population. This is especially important in this instance, with no significant difference between the validity coefficients for GPA 11-12 and HS GPA.

Although a correlational approach to the prediction of college success has been used here, the usual problem in admissions prediction is not to predict the exact level of success, but rather to predict a pass-fail dichotomy with a minimum of error. These errors are of two kinds: false positives (i.e., predicted to succeed, but actually fail) and false negatives (i.e., predicted to fail, but actually succeed). Ideally, one would avoid both errors. Since only perfect prediction will avoid both errors (and a typical validity coefficient of .60 falls far short of perfection), in actual practice we tend to be primarily concerned with one type or the other, depending upon admissions philosophy and upon practical considerations such as the ratio of applicants to available places. False positives may be totally avoided by admitting no one; this poses the problem of institutional survival. False negatives may be totally avoided by admitting everyone; few public institutions today could accommodate all applicants, and fewer still would want to do so. The issue, then, is not whether selection will take place, but rather on what basis it will take place. Institutions with a high ratio of applicants to available places will probably seek to minimize false positives, since their public tends to accept high selectivity as necessary and challenges it only as it becomes capricious or inefficient. Public institutions with a lower ratio of applicants to available places will probably try to minimize false negatives since political pressures are more easily fueled by reports of a rejected student who was sensationally successful elsewhere than by reports of an admitted student who was a dismal failure.

The results of the present study suggest that prediction under either strategy could be improved by utilizing information about both the pattern and the level of high school achievement. The first step would be to classify the applicant as to pattern: Early Bloomer, Late Bloomer, or Steady Student. For each pattern, then, utilize the predictor that will minimize the incidence of the type of predictive error that is perceived as most serious. The following example, using a random sample of 191 Fall 1965 freshmen, will illustrate the value of the procedure.

Using the cutoff points and choice of variable derived from the 1960-62 sample, the following results were obtained on a criterion of 2.0 or better during the first semester at college:

Results

Strategy	Predictor	True Positives	False Positives	False Negatives
Single uniform predictor	GPA 11-12[1]	97	32	34
Single uniform predictor	HS GPA	93	29	38
Minimize false positives	optimal predictors	89	27	42
Minimize false negatives	optimal predictors	101	34	30

[1] Average for 11th grade only. 12th grade not available for most students in the 1965 sample.

While these data cannot be considered conclusive, they do illustrate the trend. The gains from a pattern-level strategy depend upon the differential effectiveness of predictors within a pattern group, and upon the number of persons in the pattern group. The important thing is that this strategy cannot lose--it can only gain.

It should be emphasized that the "false negatives" above include only the false negatives who were admitted with predicted performance under 2.0. It is hoped that minimizing these would minimize the unknown number of unadmitted false negatives.

The concept of using different predictors for different sub-groups of applicants is not new. Many institutions, for example, use different predictive equations for males and females. Such equations, however, are designed to maximize the overall correlation of predictor(s) with criterion, which is not equivalent to minimizing the incidence of the most serious error (from that institution's point of view).

Summary

A sample of 405 freshmen at Eastern Michigan University were classified as Early Bloomers (slumping high school record), Late Bloomers (improving high school record), or Steady Students (consistent high school record).

Significant differences were found between groups on first semester college average with high school average as the covariate. Late Bloomers did better than Early Bloomers, but Steady Students were the best achievers in college. The college performance of Late Bloomers was predicted better (non-significantly) by total high school average than by the 11th and 12th grade average.

An optimal strategy for admissions was suggested which involves the use of the predictive procedure which, within any sub-group of applicants, minimizes the prediction errors (either false positives or false negatives) that are considered most serious for that institution. Assuming a real difference in the seriousness of the two types of error, such a procedure cannot lose, but can only gain.

THE GRADUATE STUDENT AT BERKELEY - A PROFILE

Sidney Suslow
University of California

Education at the graduate level in the United States has begun to dominate some of the major centers of learning in higher education. The University of California at Berkeley is one of these major centers. From a handful of graduates in the 1870's, the graduate population at Berkeley had grown to over 10,000 in the fall of 1965. The more important aspect of this growth, aside from number, is the ratio of graduate students to the total student body. This ratio was 1 in 10 in the year 1920 and is now almost 4 in 10. Our current academic plan includes an optimum ratio of slightly more than 5 in 10, that is, a student body dominated by graduate students.

The facts included in this paper are taken from a long-range study of graduate students which is now nearing completion at Berkeley. This study concerns itself with students who entered Berkeley as new graduate students in the fall semesters of 1924, 1935, 1949, 1954, and 1960. The total number included in the study is 8,144. In size, the entering classes range from 680 in the fall semester of 1924 to 2,762 in the fall of 1960. The records of these students were examined for certain demographic characteristics as well as for academic characteristics and performance.

Before continuing into other sections of this report, two aspects need exposition. The brevity of this report precludes a full development of many factors considered in the comprehensive long-range study; also, the nature of a study of this type encourages emphasis on differences at the expense of similarities. Among the five groups of graduate students, we found numerous characteristics which were as interesting for their similarities as for their differences.

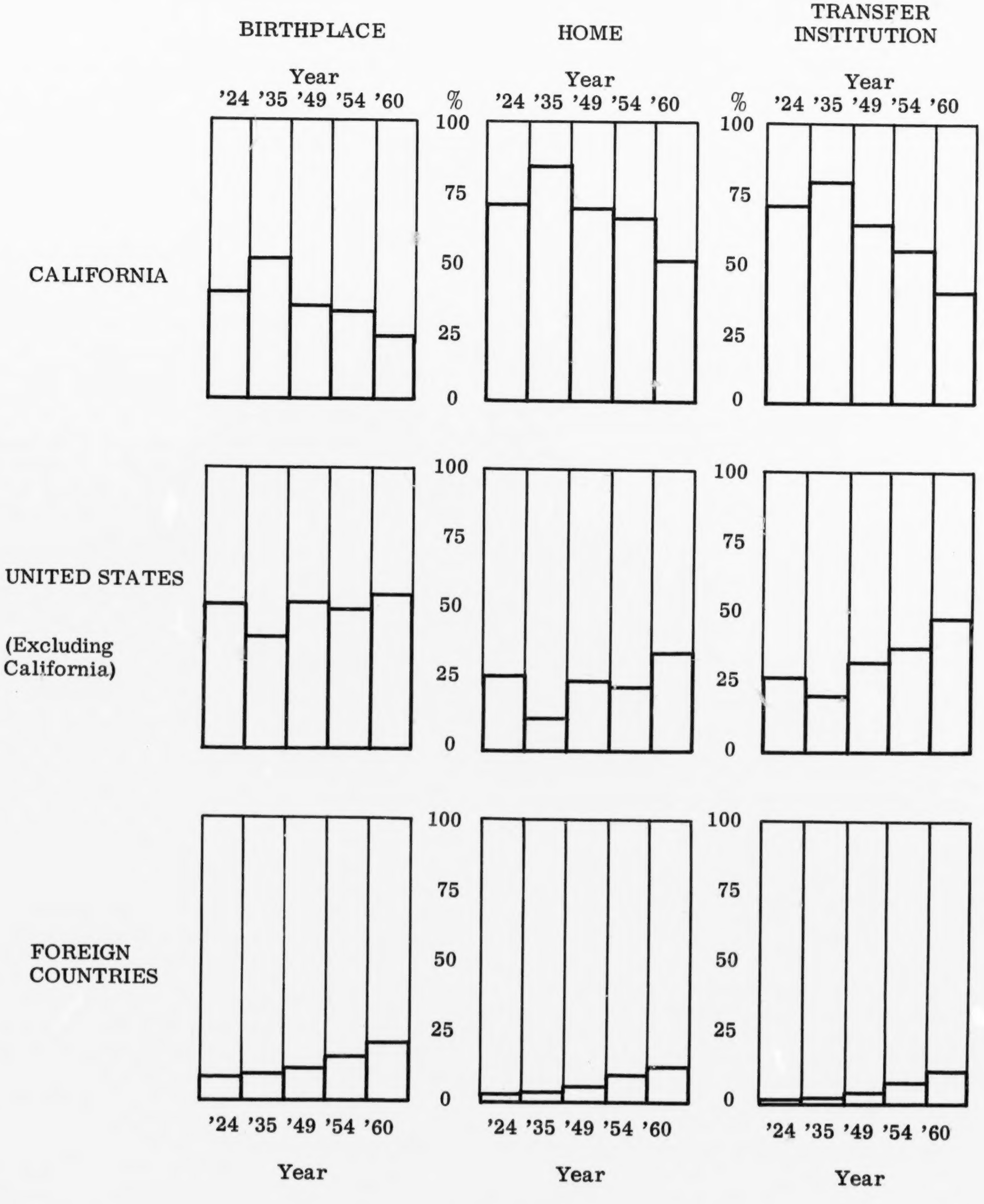
Origin

One of the factors we considered important to the study was the geographic location of the student prior to entrance into Berkeley's graduate division; however, in our highly mobile society, point of origin can be a very ambiguous fact unless the definition of origin is clearly stated. In order to ascertain whether the Berkeley graduate was becoming more or less of a local resident, three localities were considered: birthplace, home at time of admission, and the college or university where the last degree was earned. The trends found in Table I in all three types of data show decreases in the proportions of California students among the graduate population at Berkeley.

In 1924, about 39 per cent of the graduates were born in California compared to only 24 per cent in 1960. Except for the year 1935, when 85 per cent of the students gave California as their home at time of admission, the percentage of graduates with California homes declined a few points from 71 per cent to 67 per cent over the years and then showed a sharp drop to 52 per cent in the year 1960. By 1960, students were seeking the best graduate education they could get in their particular field of study regardless of distance traveled or out-of-state tuition costs. Students from out-of-state and foreign institutions constituted 61 per cent of the new graduates in 1960 compared to 45 per cent only six years earlier and 30 per cent in 1924. The largest increase in out-of-state students has come from colleges and universities in the northeastern section of the United States. The increase in students from out-of-state and foreign institutions has meant, of course, an important change in the graduate population, wherein the proportion of new graduates who come from the undergraduates ranks at Berkeley itself has declined from 62 per cent to 22 per cent during the years under study.

TABLE 1. GEOGRAPHIC ORIGIN OF NEW GRADUATE STUDENTS

PERCENTAGE DISTRIBUTION



Age at Entrance

Subtle variations and trends in demographic information are assessed with difficulty when major upheavals such as depressions and wars are included in the periods of time under study. At first glance, in Table 2, the distributions of ages of the entering graduates of 1924 and 1960 look similar enough to each other to credit prosperity for the similarity. At each end of the study, roughly one-half of the men and two-thirds of the women were under 25 years of age. During the depression, both men and women graduate students were younger; almost three-quarters were under 25 years of age. The war years affected the age distribution of both men and women, but, of course, the men the most, with less than two-fifths of them under 25 years when they first entered graduate work at Berkeley.

TABLE 2. AGE OF NEW GRADUATE STUDENTS AT ENTRANCE TO BERKELEY BY PERCENTAGE

Age At Entrance	Fall Semester Entrance														
	1924			1935			1949			1954			1960		
	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T
	Percentages														
Under 20	1	1	1	1	1	1	*	1	*	-	-	-	1	*	*
20-24	54	65	60	69	77	72	38	59	43	42	56	46	50	62	53
25-29	26	16	21	19	10	16	43	21	38	36	19	31	32	17	28
30-34	8	9	9	7	7	7	12	8	11	13	9	12	10	8	10
35-39	5	5	5	3	4	3	4	6	4	5	6	5	5	5	5
40-44	3	3	3	1	1	1	2	3	2	2	5	3	2	4	3
45-49	2	1	1	1	1	1	1	1	1	1	3	2	1	3	1
50-54	1	1	1	-	-	-	*	1	1	1	1	1	*	2	1
55 and over	*	-	*	*	-	*	*	*	*	*	1	1	-	-	-
Total %	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Number of Students	305	375	680	720	426	1146	1556	495	2051	1102	403	1505	2014	748	2762

* Less than 0.5 percent.

Lest the preceding figures mislead us into thinking that we have come full-circle, two factors must be pointed out which undoubtedly have influenced the age distribution of the entering graduates. The first and most important is the rise in the proportion of students who enter with a master's degree from 6 per cent in the early periods of the study to 9 per cent after the war and 13 per cent by 1960.

The second factor affecting the age distribution is a basic change in the motivations of individuals who seek graduate education. The majority of students who entered graduate study prior to 1954, probably had planned for this continued education during their undergraduate years or certainly near the end of those years. Now, more and more individuals are deciding to enter graduate work several years after having earned their undergraduate degree. Also, many individuals are returning after having earned a master's degree to work for a doctorate. The degree these individuals already hold has been found to be inadequate for their professional needs or future plans. Prior to 1954, only 30 per cent of the students who came to Berkeley with a bachelor's degree, came within one year after earning that degree; in 1954 and 1960, this percentage rose to about 45 per cent.

Students entering with master's degrees are also returning to higher education in larger proportions after more than one year's absence. Prior to 1960, from 56 per cent to 65 per cent of those who held a master's degree at entrance to Berkeley had received this degree more than one year earlier; by 1960, this proportion had risen to 75 per cent.

Academic Background

Two aspects of the graduate student's academic background have changed significantly in the past forty years: the type of degree held at the time the student came to Berkeley, and the type of institution at which he earned his previous degree.

The increase in the proportion of students who enter with a master's degree has already been noted, a proportion which has doubled from 6 per cent to 13 per cent since 1924. One important factor in this increase has been the steady rise in the proportion of women who enter with a master's degree, from 4 per cent to 11 per cent.

Two figures which permit a rather interesting illustration of a major shift in the graduate population at Berkeley are the almost equal numbers of new graduates in 1935 and 1960 who came from the undergraduate ranks at Berkeley itself, about 600 in each year. In 1935 these 600 students constituted 52 per cent of all entering graduates, but, in 1960, the same number accounted for only 22 per cent; however, the most dramatic change in the distribution of graduate students from the various types of institutions has taken place since 1954. With small fluctuations, the percentage of students from private institutions was around 22 per cent for each year studied except 1960 when it jumped to 40 per cent.

Where do these students come from? A sample of nine private institutions which in 1960 contributed large numbers of graduates to Berkeley shows that the number of students coming from these institutions increased three-fold in the thirty years between 1924 and 1954 and experienced another three-fold increase in the brief period of six years between 1954 and 1960 (Table 3).

TABLE 3. PRIVATE INSTITUTIONS CONTRIBUTING LARGE NUMBERS OF GRADUATE STUDENTS TO BERKELEY IN 1960

Institution of Origin	Number of Students Who Entered		
	1924	1954	1960
Stanford	9	32	91
Harvard	3	16	52
Columbia	11	21	46
Yale	0	5	32
M.I.T.	2	6	31
Chicago	10	13	29
Princeton	0	6	26
Cornell	1	11	22
Northwestern	1	5	22
Total	37	115	351

Field of Study for First Degree or Certificate Attempted

The distribution of students among the various fields of study has undergone certain changes over these years, but for the most part these changes have not been radical. Table 4 shows the most significant increase has been in engineering, with a lesser increase in the physical sciences; while agriculture, arts and literatures, and biological sciences have decreased slightly. Social sciences have shown a slight decrease since 1949.

TABLE 4. FIELD OF STUDY FOR FIRST DEGREE OR CERTIFICATE ATTEMPTED

Field of Study	Fall Semester Entrance 1924	1935	1949	1954	1960
			Percentages		
Agriculture	5	9	5	3	3
Arts and Literature	22	19	15	12	15
Biological Sciences	7	7	9	5	5
Engineering	2	5	6	6	13
Physical Sciences	10	8	10	11	13
Professions	30	33	30	40	32
Social Sciences	25	21	25	23	20
Total Percent	100	100	100	100	100
Total Number of Students	680	1,146	2,051	1,505	2,762

Academic Performance

No perfect criterion exists for measuring the successful performance of graduate students. An individual who leaves the University with a master's degree may be tallied with the successful students, but he may consider himself a failure for not having achieved his ultimate goal of a Ph.D. degree. In Table 5 the proportion of students who have earned at least one graduate degree or certificate at Berkeley has changed very little, ranging from 58 per cent to 64 per cent, with a very slight but steady increase between 1935 and 1954. Assuming that a reasonable proportion of those 1960 students who are still enrolled and actively seeking a degree will be successful, the 1960 per cent successful should continue this trend.

Within this relatively steady proportion of successes, a significant change has occurred in the type of degrees earned (Table 6). While the number of students earning certificates, primarily in education, declined from 41 per cent in pre-World War II years to 12 per cent in 1960, the number earning master's degrees rose from 33 per cent to over 60 per cent. Only a small overall increase in the proportion of students who earned a doctorate appears in the study, although the proportion of such degrees among students entering in 1949 is significantly larger than for the other years.

TABLE 5. PER CENT OF STUDENTS WHO EARNED A GRADUATE DEGREE OR CERTIFICATE AT BERKELEY

	Fall Semester Entrance				
	1924	1935	1949	1954	1960
Total number of students	680	1,146	2,051	1,505	2,762
Per cent who earned a degree or certificate	64%	58%	61%	62%	60%
Per cent enrolled and seeking a degree or certificate					7%

TABLE 6. TYPE OF GRADUATE DEGREE OR CERTIFICATE EARNED AT BERKELEY

	Fall Semester Entrance				
	1924	1935	1949	1954	1960
			Percentages		
Certificate	41	55	22	19	12
Bachelor of Laws	12	9	7	7	12
Master's	39	27	54	61	65
Doctorate	8	9	17	13	12
Total Per Cent	100	100	100	100	100
Total number of students who earned a degree or certificate	432	663	1,245	936	1,646

A very interesting fact about the graduate students studied is that for a student who successfully completes his first semester at Berkeley and continues into the following spring semester, the chances of earning a degree or certificate are better than 8 in 10, whereas, for a student who does not continue into the spring semester, the chances of success are less than 2 in 10.

Only a long-range study such as this one can uncover some of the pertinent facts about graduate students. We found a surprisingly large number of graduates who attempted to earn more than one degree. From one-fifth to one-fourth of the students who earned one degree or certificate either continued or returned to Berkeley at some subsequent date to work for a second degree or certificate--often a doctorate. In the years prior to 1960, roughly 40 per cent to 65 per cent of those students who attempted a second degree or certificate were successful. Among students entering in 1960, 30 per cent of those who have continued after earning one degree or certificate have already earned a second, and an additional 45 per cent are still enrolled.

The Doctoral Student

Our study shows that an increasing proportion of Berkeley graduate students are working for a doctorate, although the exact number of such students is difficult to determine since students change degree objectives from master's to doctor's and back again. In 1935, only 11 per cent of the entering group indicated that they were seeking the doctorate; this percentage rose from 18 per cent after the Second World War to 26 per cent in 1960, and these increases occurred in almost every field of study.

Table 7 shows that among students entering in 1960, the proportion of students seeking the doctorate varied widely among fields of study. In agriculture, biological sciences, and physical sciences, the percentage of students seeking the doctorate ranged from 47 per cent to 58 per cent; by comparison the percentages for arts and literature and engineering were about 20 per cent; for social sciences, 30 per cent; and for the professions, only 9 per cent.

TABLE 7. PER CENT OF STUDENTS IN EACH FIELD OF STUDY WHO WERE SEEKING THE DOCTORATE AT BERKELEY
(Based on Statement at Time of Admission)

	Fall 1954 Entrance		Fall 1960 Entrance	
	Total Number of Students	% Seeking Doctorate	Total Number of Students	% Seeking Doctorate
Agriculture	45	33	78	47
Arts and Literature	196	16	425	19
Biological Sciences	77	46	131	52
Engineering	88	14	338	21
Physical Sciences	164	61	354	58
Professions	602	4	867	9
Social Sciences	333	23	569	30
Total	1,505	19	2,762	26

Probably no single factor of the Ph.D. program has elicited so much discussion in the last few years as the length of time required to earn this degree. The necessity of the dissertation, the quality of the dissertation, the value of the language requirement, and other aspects of the Ph.D. program have occasioned controversial discussions also; but the time factor has become crucial in this era of tight space and tight budgets. Unfortunately, no part of the Ph.D. program is assessed with greater difficulty than the length of time needed to earn this degree.

Before we consider any figures, some of the problems of analysis must be pointed out. In the first place, the distributions of students as to time are very skewed. Most of the students who earned doctoral degrees are clustered around a short range of years, but many are spread thinly along a wide range. One student who entered Berkeley in 1935 earned the Ph.D. twenty-three years later. In the second place, time between entrance and degree cannot be interpreted as number of years in actual study since many students had long absences on their way to the Ph.D. and others returned to begin their work on the Ph.D. several years after having earned a master's degree. One other complication is that, prior to 1960, graduate students who had completed their course credit requirements were not required to register with the University: therefore, we could not ascertain whether they were actively working on their degree in some laboratory or library or whether they were absent from their studies.

As a start toward analyzing the data, we divided the students who had earned a Ph.D. into three groups: (1) those who entered Berkeley with a bachelor's degree and earned a doctoral degree only; (2) those who entered with a bachelor's degree and earned another degree first, probably a master's degree, before earning a doctoral degree; (3) and those who entered Berkeley with an advanced degree and earned a doctoral degree only.

With cautious interpretation, our study shows that the doctoral candidate of today is taking slightly longer to earn his degree than his peer did in 1924, but the criticisms of extraordinary numbers of years of study appear to be without foundation. In 1924, 13 out of 17 students, or 76 per cent, who entered with a bachelor's degree and who earned no other graduate degree while at Berkeley completed their doctoral program within four years or less, while in 1935, 1949, and 1954, the percentages for the same type of student varied between 45 per cent and 51 per cent. A student who earned a master's degree on the way toward earning a Ph.D. would usually require more than four years. In 1924, among students who had earned a master's degree at Berkeley before going on to the Ph.D., 75 per cent had earned the latter degree within six years, while in 1935, 1949, and 1954 the equivalent figure varied from 49 per cent to 60 per cent. For those students who entered Berkeley with an advanced degree from another institution, the percentage who earned a doctoral degree within four years was 94 per cent in 1924 and between 56-58 per cent in 1935, 1949, and 1954. In each of these comparisons, the number of years between entrance and completion of the doctorate is smaller for the 1924 students than for those entering in the other years; however, the similarities between 1935, 1949, and 1954 are striking.

Unfortunately, it is not meaningful to include figures based on 1960 entering students in these comparisons since these percentages will change significantly over the next few years, as more students complete their degrees and are included in our group of doctoral recipients.

One final note about the time needed to earn a Ph.D. degree. Table 8 shows that in general, the students who entered Berkeley with an advanced degree required about the same number of years to earn the Ph.D. as students who entered with a bachelor's degree only and who earned the Ph.D. only. This was not true in 1924, but the percentage distributions of these two types of entering students in 1935, 1949, and 1954 are more similar than would be expected from the fact that those who entered with an advanced degree would be considered better prepared to complete the doctoral program more rapidly.

In this brief paper, I have only been able to indicate some of the salient features of our long-range comprehensive study of the graduate student at Berkeley. Although we do not have the information available to make comparisons with other institutions, we hope these comparisons will be made after our report is published.

TABLE 8. YEARS BETWEEN ENTRANCE AND RECEIPT OF DOCTORAL DEGREE
(Per cent Distribution)

		No. of Students	Years																Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
										Per cent of Students									
Entered with Bach.; Earned Doct. Only	1924	17		18	35	24	12	6					6						100.0
	1935	45	2	7	22	20	20	13	9	4			2						100.0
	1949	129			16	29	17	14	8	4	3	6	2	1					100.0
	1954	76		1	9	37	21	17	7	4	3	1							100.0
	1960*	110		2	15	58	25												100.0
Entered with Bach.; Doct. Second Degree Earned	1924	20	5	20	20	10	15	5			10		10		5				100.0
	1935	37			14	8	22	16	5	5		3	5		5		3	13**	100.0
	1949	87			5	11	16	17	13	15	6	7	7	1				1	100.0
	1954	37			3	3	27	22	14	11	8	5	5		3				100.0
	1960*	25		4	12	60	24												100.0
Entered with Advanced Degree; Doct. First Degree Earned	1924	17	6	53	29	6			6										100.0
	1935	16	6	6	19	25	13	6	13	6							6		100.0
	1949	83	2	5	23	28	12	12	7	2	4	2	1	1					100.0
	1954	45		2	16	38	29	9	2	2			2						100.0
	1960*	60		3	17	55	25												100.0

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* Includes only those students who had completed their doctorate by 1965.

** Includes 5% at 16 years, 5% at 18 years, and 3% at 23 years.

FACULTY INPUT: A FUNCTION OF A COLLEGE'S INCENTIVE SYSTEM

Herman A. Wallin
University of Oregon

Colleges and universities are undoubtedly becoming more complex institutions. In addition to serving more people in more diverse ways, educational institutions are being affected by the accelerated rate of growth of knowledge. To all this, Meyerson adds that institutions of higher learning are faced with the task of reconciling "the eternal traditions of a community of scholars with the needs of a modern democracy in swift evolution."[1] These circumstances project a more complex school and, thus, a more diverse and specialized faculty.

Increased specialization of workers in organizations poses a number of dilemmas for administration. One such dilemma, the context in which this paper is based, is the problem of mediating the differential requirements of a formal organization and its professional staff through an appropriate system of incentives.

Organizations demand loyalty from their employees, and reward it with status in the organization. Professions demand a loyalty too, and reward it with status in the profession. Not occasionally, the requirements of a successful career in an organization conflict with those for a successful career in a profession. The individual may be caught between the conflicting criteria of status and success set by the organization for which he works and the profession to which he belongs. Thus, taking on administrative duties may be the only way of advancing in an organization, but the assumption of such duties implies the curtailment of professional activities and, therefore, of a professional career. In sum, there is a potential conflict between organizations and professions with respect to motivation and incentives, and the corresponding kinds of contributions which organizations seek from professional workers.[2]

Colleges are among the many organizations which are faced constantly with the challenge of making the best possible accommodation between these sometimes opposing sets of requirements. Lieberman,[3] in a discussion of teaching as a profession, concludes that the much higher salaries paid to administrators tends to weaken the lure of teaching as a career. The route away from teaching to administration appears to be a function of the reward system in many types of educational organizations.

> Since the only way to get a top salary is to go into administration, teachers tend to concentrate on work in educational administration instead of improving their teaching (in terms of their inservice education). . . Opportunities for teachers to make high salaries would enable individuals to devote a lifetime to teaching. . . This is not possible today in public education except through educational administration and a few other nonteaching specializations.[4]

The college instructor faces conflicting demands in the form of teaching versus research. Much time, nevertheless, has to go into teaching and meeting with students--who are rarely satisfied with the amount of time their teachers make available for consultation purposes. Yet most rewards for the professional, particularly if he is located at a university, are based upon research and scholarly publication.

> Although there is some controversy over what constitutes the primary and the secondary goals of outstanding universities, it seems fair to conclude that a majority of the members of their professional staff would see research as primary and teaching as secondary. This is well reflected in the prestige and promotion systems.[5]

The instructor, because of the pressures and rewards of the system, may invest heavily in research and, (as a result may) in so doing, give less time to preparing for lectures and reduce the hours in which he is available.[6] The route away from teaching to research and publication appears to be a function of the incentive system in many universities and some colleges.

The Problem

A question of interest to many students of higher education emerges: how responsive are college teachers to various provisions of an incentive system? Would a change in the basis for advancement in salary or rank induce faculty members to redefine their roles in the direction of the incentive change? For example, if the extent to which a college teacher engaged in "skill maintenance" activities became one of the criteria for promotion, would this provision stimulate increased efforts at keeping up-to-date? What of activities which generally receive low priority among professors: teaching (in research-centered universities) and offering remedial courses to weak students (in public two-year colleges), for example? Through the use of appropriate incentives, could the cooperation of faculty members be elicited in performing such low-appeal activities?

Though there exists a number of studies on the impact of incentive systems in other organizational contexts, little, other than pure conjecture, is known about the role various incentives play in institutions of higher learning. An attempt to begin a systematic study of incentive systems in two-year colleges was made recently by this writer.[8] One group of findings from that study, that are included herein, provides some preliminary evidence that the variations between the two types of incentive systems studied accounted for variations in the degree to which faculty members (1) pursued skill maintenance activities, and (2) engaged in activities generally regarded by the faculty to be peripheral at best.[9]

The Study

The Setting

It is inevitable that two-year colleges will be sensitive about the caliber of teaching done in that portion of the curriculum which constitutes the first two years of studies leading to the baccalaureate degree. Students in this "transfer" program will move at the end of the second year to a four-year institution to complete their degree requirements, some more successfully than others. It follows that if a two-year college is to build and maintain a reputable image (and thereby continue to enjoy the confidence of its patrons, the surrounding community), standards approximating those of the receiving institutions in both teaching and grading must be maintained.[10] Failure of transferring students to meet the demands of the higher level school would be interpreted to mean weakness in the lower school. This fact rightly or wrongly suggests, among other things, that teachers in the feeder institutions must keep up-to-date with recent developments in their field. Would one kind of incentive system be more effective than another in stimulating faculty members to maintain their skills at a high level?

For many public two-year colleges, especially those which derive their financial support principally from the surrounding community, there are at least two areas (in addition to teaching) which receive emphasis in statements of institutional objectives. One of these areas concerns the immediate client - the student. Faculty members are expected to provide counsel to students on matters ranging from curriculum and career alternatives to study habits.[11] This expectation is over and above the formal guidance and counseling program colleges maintain through specialized full-time staff. The other of the two areas concerns the secondary clients - the taxpaying public. The two-year college makes available to the non-student population of the surrounding area both cultural and educational programs in what is claimed to be an attempt to "maximize the returns of public investment."[12] Providing a non-credit evening course in art history at the request of the local sketch club or encouraging faculty members to participate in the life of the local community would be cases in point.

Professionals in two-year colleges do not seem to be as committed, however, to such objectives as community service and student guidance as they are to teaching college-level credit courses to full-time students. Thus, non-teaching activities are likely to be viewed as ancillary and worthy of only nominal support. Studies of two-year college faculties reveal considerable divergence of opinion among various segments with respect to priority of purposes.[13] Administrators, for example, are much more wedded to the non-teaching goals than are teachers.

Full-time student counselors see counseling as a more crucial activity than do instructors, and instructors tend to place more emphasis upon "regular" courses in their particular areas than upon remedial and non-credit offerings. Would one kind of incentive system be more effective than another in securing the cooperation of faculty members in undertaking activities which many of them regard as non-essential?

To gain data on the relative effectiveness of various types of incentives in affecting faculty input in these areas, two colleges, one utilizing a merit-type of incentive system, Merit College, the other a non-merit incentive system, Non-Merit College, were selected for the study.[14] Merit College assigns to its faculty academic titles, each of which has its own salary scale. As in the case of many universities, neither salary advancement nor advancement in rank is automatic. Advancement is contingent, rather, upon receiving satisfactory performance evaluations from higher echelon colleagues. Ratings are given each year and are concerned with the performance of those services the college wishes to emphasize: skill maintenance activities, counseling, and community service, to mention three. Non-Merit College has no "formally institutionalized allocation of rewards and penalties to enhance compliance with (its) norms, regulations, and orders."[15] It has no career ladder for the professional staff: all are labeled "instructor" irrespective of their function or competence. Annual salary increments are automatic until a maximum (based upon amount of training) has been reached: neither the quality nor the quantity of performance is a factor, except in a few extreme instances. By earning additional graduate credits from some institution of higher learning (through part-time study, for example) a new maximum is thereby attainable. The highest salaries and a differentiation in title go to those who perform non-teaching functions: deans, directors, and other administrative officers.

Design

Data with which to assess the response of instructors in the two colleges to the two different types of incentive systems were gathered over a three-month period in 1965, by means of interview, observation, and documentary analysis. Within each of the college's teaching divisions, the faculty were stratified by seniority (non-tenured, tenured) and a 38 per cent proportional, stratified, sequential sample was drawn.

In selecting the colleges, care was taken to find two institutions that were comparable in as many respects as possible (with the exception of their formal incentive structure): cultural and educational climate - 25 miles distance between the two colleges; size - 1,850 full-time students as compared with 1,800; faculty - 119 as compared with 111; programs - both offered lower-division work leading to the A.B. degree, as well as more specialized occupational curricula which could be completed within a two-year time span; quality of offerings - both were fully accredited and students completing their lower division work there could transfer without loss of credit to any of the leading state universities.

Both colleges had similar governing structures: a lay board of trustees, an appointed administration headed by a president, and a faculty senate responsible to the professional teaching staff. The authority vested in the administration of one college was neither more nor less than that vested in the other by virtue of state regulations and the existence of active faculty senates. The balance in the two faculties between males and females, between various levels of academic preparation, and types of previous teaching experience was comparable. Self-selection of the faculty on the basis of a preference for one type of incentive system over another appeared not to be operating: fewer than 5 per cent in either college could recall having prior knowledge of the type of incentive system that their particular college used. Not only did both schools have a similar financial capability, they both spent similar amounts of money, as measured by *per capita* expenditures.

The Findings

Skill maintenance activities. There are many ways in which professional staff in colleges may keep up-to-date in their fields. Three of the most frequently followed, and which were specifically examined, are: reading journals relevant to teaching field, formal studies, and participating in conferences and seminars.

TABLE 1. A Comparison of the Number of Faculty Members Who Read Journals Related to Teaching Field

	Non-Merit College	Merit College	N
	%	%	
Read journals relevant to teaching field during current academic year	37 (18)	56 (22)	40
Had not read journals related to teaching field during current academic year	63 (30)	44 (17)	47
	100% (48)	100% (39)	87

$X^2 = 7.25$ df = 1 $P < .01$

With respect to the first of the three activities, reading relevant journals, the findings reveal that a significantly higher number of teachers at Merit College indicated a familiarity with journals related to their teaching field than did teachers at Non-Merit College - 56 per cent as compared with 37 per cent. Familiarity or non-familiarity was determined on the basis of whether or not those who claimed they read relevant journals during the current academic year were able to cite specific articles which they had found appropriate to their teaching field. Some 63 per cent of the NMC faculty, as compared with 44 per cent of the MC group, could give no evidence of having made use of journals related to their subject area.

Data with respect to the second of the three skill maintenance activities, formal studies, revealed that 82 per cent of the MC staff as compared with 54 per cent of the NMC staff had pursued advanced study in the past two years. This fact is the more revealing when juxtaposed with the fact that both faculties held a comparable number of baccalaureate and advanced degrees.

TABLE 2. A Comparison of the Number of Faculty Members Who Undertook Advanced Study in Previous Two Years

	Non-Merit College	Merit College	N
	%	%	
Undertook advanced study in previous two years	54 (26)	82 (32)	58
Did not undertake advanced study in previous two years	46 (22)	18 (7)	29
	100% (48)	100% (39)	87

$X^2 = 18.01$ df = 1 $P < .001$

The third activity investigated, attending conferences and seminars, was engaged in to a greater extent by the teachers at MC than by the staff members at NMC. In the previous two years, this method of keeping up-to-date was employed by some 74 per cent of the Merit faculty as compared with 54 per cent in the other college. The sponsors of the activities included in this category were professional education associations as well as associations of the subject matter disciplines, such as the regional sociological association.

TABLE 3. A Comparison of the Number of Faculty Members Who Attended Conferences and Seminars in Past Two Years

	Non-Merit College	Merit College	N
	%	%	
Attended conferences and/or seminars in past two years	54 (26)	74 (29)	55
Did not attend conferences and/or seminars in past two years	46 (22)	26 (10)	32
	100% (48)	100% (39)	87

$X^2 = 10.08$ df = 1 $P < .01$

Activities having low priority among faculty members. Both colleges encouraged their staffs, by means of policy statements contained in faculty handbooks, for example, to participate in the public life of their respective communities. During the semi-structured interviews faculty were asked about the community activities in which they were involved in the previous two years.

TABLE 4. A Comparison of the Number of Faculty Who Participated in Community Service Activities During Previous Two Years

	Non-Merit College	Merit College	N
	%	%	
Indicated some activity during previous two years	54 (26)	67 (26)	52
No community activity in previous two years	46 (22)	33 (13)	35
	100% (48)	100% (39)	87

$X^2 = 3.6$ df = 1 $P < .06$

Some 67 per cent of MC's staff had engaged in some form of community activity in the past two years as compared with 54 per cent of NMC's. Activities included such non-remunerative acts as speaking engagements, holding an executive office in a community agency, or serving in some voluntary capacity such as a community chest canvasser. The variation in the level of voluntary participation in local activities, between the groups, though significant statistically, is not as pronounced, however, as the variations in "moonlighting" kinds of activities.

One might expect to find that professionals who accept employment in a college which is oriented toward community service would tend not to seek out part-time employment opportunities. Such jobs would reduce the amount of time that would normally be available for community projects and the amount of time and energy a teacher would have left to give to his primary occupation. Moreover, moonlighting activities of two-year college staffs cannot be likened to the entrepreneurial careers of many university faculty where outside jobs are frequently related to their areas of expertise. The outside activities for purposes of this present study included operating a vending machine concession, selling insurance and real estate, and directing a remedial reading clinic for children of grammar school age, to mention a few. Also included in this general category of "outside activity" is teaching in the evening division. However, only teachers, who were not contractually obligated to teach in the evening division and who reported that the choice of assuming additional teaching responsibilities for additional salary was completely their own, are included.

The data show that Non-Merit College faculty were more actively involved in moonlighting-type jobs than were the faculty members at Merit College: 75 per cent as compared with 46 per cent. Some 54 per cent at MC as compared with 25 per cent at NMC indicated no outside employment for which added remuneration was received.

TABLE 5. A Comparison of the Number of Faculty Who Engaged in Outside Remunerative Activities During Current Academic Year

	Non-Merit College	Merit College	N
	%	%	
Indicated outside employment for additional remuneration:			
(1) Evening College Teaching	44 (21)	31 (12)	33
(2) Other types of activities	25 (12)	10 (4)	16
(3) Both teaching and other	6 (3)	5 (2)	5
Indicated no outside employment for additional remuneration	25 (12)	54 (21)	33
	100% (48)	100% (39)	87

$X^2 = 17.6$ df = 1 $P < .001$

A second low priority activity, student counseling, receives only nominal support from most two-year college staff, though college handbooks insist that counseling is the responsibility of all teachers. Non-Merit College provides each of its instructors with the following statement:

> Hold office hours for student consultation, allowing if possible, at least one hour a day for this purpose. Counsel students whenever there is an opportunity, recognizing that the individual teacher often has the finest opportunity for guiding individual students.

Merit College's statement is similar:

> A teaching load should allow time outside that spent in classroom instruction... for individual student contacts, where counseling and extra assistance can be available... one hour a day plus other hours as needed.

Little evidence was obtained while on campus to suggest that teachers at NMC kept regular office hours for the benefit of students. No documents or schedule were available that listed office hours, nor were hours posted on the doors. MC, on the other hand, had available for each semester the timetable of every faculty member, including a listing of office hours. According to this schedule, the average for the whole faculty at MC was 5.45 hours per week.

In addition to this observational type of evidence, data were secured from faculty members by asking them, during the interviews, to describe their teaching assignment as well as any other responsibilities they were expected to assume - responsibilities such as club sponsorships, committee memberships, student counseling, and so forth. Table 6 indicates that of the teachers interviewed at NMC some 10 per cent named counseling as one of their regular weekly activities as compared with 41 per cent of MC's interviewees.

TABLE 6. A Comparison of the Number of Faculty Who Named Student Counseling as a Weekly Responsibility

	Non-Merit College		Merit College		N
	%		%		
Named student counseling as one of several weekly responsibilities	10	(5)	41	(16)	21
Did not name student counseling as a weekly responsibility	90	(43)	59	(23)	66
	100%	(48)	100%	(39)	87

$X^2 = 22.6 \quad df = 1 \quad P < .001$

Discussion

One of the colleges, Merit College, seemed to be more successful in eliciting from its instructors cooperation in all three of the activities discussed herein. Three features unique to the MC incentive system appear to be largely responsible for its greater capability.

(1) Evaluation Machinery. The staff at MC receives each year written performance evaluations from a team of senior colleagues. These evaluations provide "feedback" not only on how strong (or weak) the committee believes an individual's contribution to be, but, more importantly, on what priorities the college assigns to particular activities. Apart from a major evaluation of the work at the end of the first year of a beginning instructor at NMC, no regularized machinery exists. Comments from the interview data will help to illustrate how the regular evaluations of MC served to articulate the college's objectives to its work-force. The lack of feed back at NMC seemed to give rise to the feeling by faculty that no one cared what they did.

> (From NMC) Journals? I used to take a few. Every now and again I get the feeling I'm losing touch--but I don't think my teaching is any worse than it used to be. It's hard to tell--no one seems to care much.

> (From MC) I'm trying to allocate my time differently this year so that I can give some time to a recently organized coordinating council for cultural activities in our city. The college has encouraged me to become more active in such affairs, believing that I have the ability to make such a contribution.

(2) Rewards and penalties. Both salary and status advancement are given to those at MC who are judged to be effectively carrying out the purposes of that college. For those whose services are judged to be exceptionally outstanding, early promotions in rank are not uncommon. NMC's program of guaranteed rewards irrespective of either the quality or quantity of the services being rendered, seemed to act as a depressant which dulled the professional orientations of many faculty. In the case of MC staff, there is always present the prospect that the college might withhold a salary or rank advancement. This possibility encouraged instructors to be more aware of the expectations Merit College held for them.

> (From NMC) I do very little beyond the actual teaching of my courses. I do teach in the evening division to supplement my income, though. Between those two jobs and looking after my back-yard greenhouse I just can't get enthusiastic about coaching a lot of students who aren't ready to be in college anyway.

> (From MC) One of the things I like about this place is that those who are interested in doing a better job get some recognition. At my previous school I knew I could go only so far salary wise if I didn't get my master's degree. While having a master's degree is still important here, they do recognize (other types of contributions). Even though I didn't earn any more graduate credit hours, I still got a raise for taking the time to work with students who need extra help.

(3) A career route for teachers. The existence of MC's career route makes it possible for instructors to advance professionally without having to change occupations, as it were. "Up" at NMC means "out," for that college has no graduated career path for its staff. The one path that it does have (from teaching into administrative work), which it rewards with both increased status and salary, tends to tilt the energies of many faculty members away from their primary obligations.

> (From NMC) Why take guidance courses during the summer? Actually, they might come in handy sometime. There's more money in full-time guidance work on this campus than in teaching physics, you know.

> (From MC) Administration courses? I haven't taken any administration courses. I'm in geology... I have trouble keeping up in that field much less branching out. At any rate, it wouldn't help my future here. If I keep up my present record, I've been told, I'll make the associateship next year.

Merit College, through the provisions contained in its incentive system, is able to give tangible evidence that it does matter whether its faculty participates in community activities and devotes time to student counseling; it does matter whether an instructor keeps up with the literature in his field. The college is able to recognize such contributions and reward them; they do not go unnoticed by "significant others." Many teachers at Non-Merit College found it extremely easy to "explain" their inactivity in community service and student counseling by a shrug and a "Who cares?" type of comment. They had soon noticed that minimal effort yielded the same economic and status returns as did service "over and beyond the call of duty." The norm of equality which so permeated NMC's incentive system elicited a "lowest common denominator" response from the faculty.

From the preliminary data gathered in this study it would seem that appropriate incentives can assist the professional teacher in establishing priorities among his various tasks such that there emerges a more functional relationship between him and his employing institution. Thus, incentive systems appear to be not the least of the organizational conditions which affect a faculty's input and deserve increased attention from institutional researchers.

Notes

1. Martin-Meyerson, in a statement issued just after he was named acting chancellor of the Berkeley campus of the University of California. Quoted in California Monthly, February, 1965, p. 19. A similar point of view is expressed in the following:

   > The Modern University has left its cloister and entered the market place. Far from concerning itself solely with the search for ultimate truth and time tested perspectives, it has come to serve the immediate needs of contemporary society. The scholar's skills are no longer applied solely to man's past, but in very large part to humanity's future. (James Cass, "What happened at Berkeley," Saturday Review, January 16, 1965, p. 69.)

2. This discussion is modeled upon the theoretical contributions of William Kornhauser, Scientists and Industry: Conflict and Accommodation (Berkeley and Los Angeles: University of California Press, 1963), Chapter V in particular.

3. Myron Lieberman, Education as a Profession (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1956). Of particular interest is Chapter 12, "The Economic Status of Teachers," pp. 373-416.

4. Ibid., p. 403.

5. Amitai Etzioni, Modern Organizations (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964), p. 85.

6. Burton R. Clark, Educating the Expert Society (San Francisco: Chandler Publishing Company, 1962). Particularly Chapter Five, "Organization of the School and College," pp. 163-201.

7. Two rather classical studies serve to document the impact which tangible incentives can have upon the actions of employees in industry. Viteles found that in 514 plants where wage incentive plans were introduced, production increased 38.99 per cent and labor costs decreased 11.58 per cent. (M. S. Viteles, Motivation and Morale to Industry (New York: Norton Publishers, 1953, p. 27.) Another study revealed that an hourly wage differential of 30 per cent led many workers in a steel plant to transfer from their non-repetitive, skilled, autonomous jobs for assembly-line jobs that lacked the desirable characteristics of the former but which paid better. (C. R. Walker and R. H. Guest, The Man on the Assembly Line, Cambridge: Harvard University Press, 1952, p. 91.) Intangible incentives such as status, prestige, and autonomy have also been shown to be powerful persuaders. Etzioni provides the following account:

   > Lawyers are known to have given up 6-digit incomes to become judges at 5-digit salaries, "compensated" by the higher prestige of the bench. Vice-presidents, miserable at being passed over when a new president was appointed, have become far less miserable when they also were "promoted" by having their title changed to that of executive vice-president. Everything that is included under status symbols--office size, assigned places in the company's parking lot, and so on--is important in the life of any organization. (Etzioni, op. cit., pp. 77-78.)

8. Herman Arnold Wallin, "The Dynamics of Incentive Systems: A Comparative Study of Variations in Professionalism in Two Institutes of Higher Learning." An unpublished Ph.D. dissertation, University of California at Berkeley, September, 1965.

9. This present paper has been adapted from two earlier papers which the author prepared:

"Incentive systems in Educational Organizations: A Look at Two Types and Their Apparent Impact Upon Skill Maintenance Activities of the Professional Work-Force." A paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois, February 19, 1966.

"Providing Incentives for Professionals in Two-Year Colleges: A Case Study of Two Approaches and Their Relative Effectiveness in Securing Service and Client Oriented Behavior." A paper presented to the annual meeting of the Pacific Sociological Association, Vancouver, Canada, April 8, 1966.

10. One of several recent discussions concerning the dominating influence of the university model upon a number of two-year college practices is by Dale Tillery, "Winds of Change." Keynote address, Spring Conference, Northwest Region, California Junior College Association, San Francisco, April 25, 1964. Mimeographed.

11. One such statement reads: "It is the specific responsibility of every junior college to assist its students to discover their own capabilities and limitations. A program of education and guidance should be provided so that every student may discover his aptitudes, choose a life work, and prepare for the successful pursuit of such work."

12. A typical statement from a college catalogue: "(The purposes of this college are:)... to provide service for the people of the community by offering lectures, forums, plays, concerts, and exhibits, and other cultural activities."

13. An example is the one carried out by Leland L. Medsker, The Junior College: Progress and Prospect (New York: McGraw-Hill Book Co., Inc., 1960). See Chapter Seven, "Faculty Attitudes in the Role of the Two-Year College," pp. 169-205. The question of weakly established values in another context, adult education schools, are the subject of study reported by Burton R. Clark, "Organizational Adaptation and Precarious Values: A Case Study," American Sociological Review, 21 (June, 1956), pp. 327-336.

14. Names of both persons and places have been granted anonymity, despite the limitations thus placed upon proof.

15. Amitai Etzioni, "Organizational Control Structure," in James G. March (ed.), Handbook of Organization (Chicago: Rand McNally and Company, 1965), p. 650.

Program Committee

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PROGRAM

SIXTH ANNUAL NATIONAL INSTITUTIONAL RESEARCH FORUM

Monday, May 2

3:00 - 7:00 p.m. -- Registration

7:00 p.m. -- General Session

Presiding: John E. Stecklein
President of AIR

Address: Imperatives for Institutional Research

Lewis B. Mayhew
Professor of Education
Stanford University

Tuesday, May 3

9:00 - 10:15 a.m. -- Financial Input Group I

Presiding: James L. Miller, Jr.
Associate Director for Research, SREB

Speakers: James L. Miller, Jr.

"An Overview"

Irene Butter, Department of Economics
University of Michigan

"Economics of Graduate Education: An Exploratory Study"

Homer Still, Budget Examiner
Florida State Budget Commission

"Summary of a National Study on Financial Analysis Practices"

9:00 - 10:15 a.m. -- Student Selection of Institution Group II

Presiding: John J. Coffelt, Vice Chancellor
Research and Planning, Oklahoma State Regents for Higher Education

Speakers: Dorothy M. Knoell, Urban College Study
State University of New York

"Free Choice vs. Planned Accommodation: Contrasting State Approaches to Student Input"

O. W. Hascall, Regional Director
American College Testing Program

"Some Practical Applications of Research Studies"

Dan Hobbs, Educational Programs Officer
Oklahoma State Regents for Higher Education

"Student Choice as an Instrument of Higher Education Policy"

10:45 - 12:00 -- Discussion Groups

Group I Financial Input

a. Private Colleges and Universities

Chairman: Joseph T. Sutton, Director
Institutional Research
Stetson University

b. "Small" Public Colleges and Universities

Chairman: Melvyn N. Freed, Director
Office of Institutional Research
Arkansas State College

c. "Large" Public Colleges and Universities

Chairman: Robert E. Hubbard, Director
Office of Institutional Research
Wayne State University

d. Inter-Institutional Agencies, State Offices

Chairman: Lester Harrell, Director
Texas Commission on Higher Education

Group II Student Selection of Institutions

a. Private Colleges and Universities

Chairman: William N. Leonard
Assistant President
Hofstra University

b. "Small" Public Colleges and Universities

Chairman: M. Olin Cook
Assistant Director
Commission on Coordination of Higher Educational Finance, Arkansas

c. "Large" Public Colleges and universities

Chairman: Thomas H. Shea
Associate for Institutional Research
State University of New York

d. Inter-Institutional Agencies, State Offices

Chairman: E. Martin Etters
Director of Institutional Research
Parsons College

1:45 - 3:15 p.m. -- Contributed Papers

Session A Systems Applications

Presiding: Clarence H. Bagley
Research Associate
Bureau of Institutional Research
University of Minnesota

Speakers: Harry S. Allen, Director
Office of Institutional Research
University of Nebraska

"A Single Data System for Capital Planning and Operational Analysis"

Louis A. D'Amico, Associate Director
Bureau of Institutional Research
Indiana University

"Forms and Procedures Used for Implementing Academic Personnel Action: Their Relation to Academic Input"

Keith W. Trowbridge, Research Analyst
Office of Institutional Research
Bowling Green State University

"A Mini-Max Distance Study Incorporating the Use of Linear Programming to Assist in Solving Campus Parking Problems"

Emerson Tully, Director of Educational Research
Florida Board of Regents

"Utilizing Academic Input on a System-Wide Basis"

1:45 - 3:15 p.m.

Session B Factors in Student Achievement

Presiding: James I. Doi, Center for Study of Higher Education
University of Michigan

Speakers: Ross O. Armstrong, Director
Bureau of Educational Research
University of Kansas

"The Influence of Geographic Origin and Campus Proximity on Student Academic Quality at State Universities"

James K. Morishima, Acting Director
Office of Institutional Educational Research
University of Washington

"Effects on Student Achievement of Residence Hall Groupings Based on Academic Majors"

LeRoy A. Olson, Associate Professor
Office of Evaluation Services
Michigan State University

"Methods and Results of Research on Living-Learning Residence Halls"

Sam C. Webb, Director
Office of Evaluation Services
Georgia Institute of Technology

"Estimating Gains in SAT Scores Attributable to Three Sources"

Wednesday, May 4

9:00 - 10:15 a.m. -- Group III Faculty Input

Presiding: Sam D. Schaff, Registrar and Graduate School Counseling
Denison University

Speakers: Mary Corcoran
Bureau of Institutional Research
University of Minnesota

"Measurement of Faculty Characteristics in a Large University: Useful Dimensions for the Study of Faculty Mobility"

L. Richard Meeth
Assistant to the President
Baldwin-Wallace College

"Data on Faculty in a Small, Independent College"

Kenneth G. Nelson, Chief
Higher Education Studies Branch
U. S. Office of Education

"Character of Faculty Input in Four-Year Colleges and Universities"

Gerald H. Whitlock
Professor of Industrial Management
University of Tennessee

"Dimensions of Professorial Competences and Their Measurement"

9:00 - 10:15 a.m. -- Group IV Institutional Research in Planning of Facilities

Presiding: L. E. Hull, Director
Bureau of Institutional Research
Indiana University

Speakers: William Fuller
The State University of New York

"Intra-Institutional Planning"

Tom R. Mason
Director of Planning
University of Rochester

"An Inverse Relationship-The Uses of Facilities Planning for Institutional Research"

Fred E. Schwehr
Space Allocations Coordinator
Board of Regents of State Colleges of Wisconsin

"Problems in Planning Higher Education Facilities on an Inter-Institutional Basis"

10:45 - 12:00 -- Discussion Groups

Group III Faculty Input

a. Private College and Universities

Chairman: R. Peter Jackson, Director
Office of Institutional Studies
Cornell University

b. "Small" Public College and Universities

Chairman: James S. Counelis
Director of the Evening Program
Illinois Teachers College

c. "Large" Public College and Universities

Chairman: Sidney Suslow
Institutional Research Officer
University of California

d. Inter-Institutional Agencies, State Offices

Chairman: Kevin P. Bunnell
Associate Director
Western Interstate Commission for Higher Education

10:45 - 12:00 -- Group IV Institutional Research in Planning of Facilities

a. Private Colleges and Universities

Chairman: Thomas C. Howard
Associate Professor, Psychology
Nasson College

b. "Small" Public Colleges and Universities

Chairman: Ernest G. Palola
Director of Institutional Planning
State University of New York at Cortland

c. "Large" Public Colleges and Universities

Chairman: Theodore H. Drews
Higher Education Studies Branch
U. S. Office of Education

d. Inter-Institutional Agencies, State Offices

Chairman: Eldridge E. Scales
Associate Director
Burroughs Corporation, Radnor Division
Omaha Job Corps Center for Women

1:30 p.m. -- Business Session of AIR

Presiding: John E. Stecklein, President of AIR -

3:00 - 4:30 p.m. -- Contributed Papers

Session C Student and Institutional Characteristics

Presiding: John A. Centra
Instructor in Office of Institutional Research
Michigan State University

Speakers: Cameron Fincher, Associate Director
Institute of Higher Education
University of Georgia

"Changes in Institutional Characteristics as a Function of Selective Admissions'

Irma T. Halfter, Director
University Testing and Evaluations
De Paul University

"Motivation and Performance in a University of Entering Freshmen"

Vernon L. Hendrix, Associate Professor
Department of Educational Administration
University of Minnesota

"Environmental Press Preferences of Students and Faculty"

John C. Heston, Director
Bureau of Institutional Research and Counseling
Albion College

"Educational Objectives of Liberal Arts Students"

3:00 - 4:30 p.m. -- Session D This, That and Some of the Other (Miscellany)

Presiding: Joseph L. Saupe, Associate Director
Office of Institutional Research
Michigan State University

Speakers: H. R. Kells, Associate Dean
State University of New York at Binghamton

"Development of a Set of Guidelines and Information Sources for Use by a Faculty Curriculum Committee"

P. Kenneth Morse
Director of Evaluation Services
Eastern Michigan University

"An Improving High School Record: Good Omen for College"

Sidney Suslow, Department Head
Curriculum Revisions - Year-Round Operations
University of California, Berkeley

"The Graduate Student at Berkeley: A Profile"

Herman Arnold Wallin, Research Associate
Center for the Advanced Study of Educational Administration
University of Oregon

"Faculty Input: A Function of a College's Incentive System"

Thursday, May 5

9:00 - 10:15 a.m. -- Group V Institutional Selection of Students

Presiding: Risdon J. Westen, Chief
Research Division
U. S. Air Force Academy

Speakers: Alexander W. Astin
American Council on Education

"Assessment of Entering Students Across a Sample of Colleges"

Ruth Churchill, College Examiner
Antioch College

"Student Selection Research at Antioch College"

John R. Hills, Director
Testing and Guidance Regents
University System of Georgia

"Selection of Students by Colleges Within a State System"

9:00 - 10:15 a.m. -- Group VI Impact of Federal Programs

Presiding: Leo Redfern
Dean of Administration
University of Massachusetts

Speakers: Leo Redfern

"An Overview"

Humphrey Doermann
Director of Admissions
Harvard University

"Impact of Federal Programs on Institutions and Institutional Planning?"

Martin Lichterman, Director
New England Board of Higher Education

"Impact of Federal Programs on Regional and Cooperative Education"

10:45 - 12:00 -- Discussions Groups

Group V Institutional Selection of Students

a. Private Colleges and Universities

Chairman: George Stricker
Associate Professor of Psychology
Adelphi University

b. "Small" Public Colleges and Universities

Chairman: Sam C. Webb
Director of Evaluation Studies
Georgia Institute of Technology

c. "Large" Public Colleges and Universities

Chairman: L. Joseph Lins
Coordinator of Institutional Studies
University of Wisconsin

d. Inter-Institutional Agencies, State Offices

Chairman: Junius A. Davis
Senior Research Psychologist, ETS
Princeton

10:45 - 12:00 -- Group VI Impact of Federal Programs

a. Private Colleges and Universities

Chairman: S. Leonard Singer
Director of Academic Communication
Brandeis University

b. "Small" Public Colleges and Universities

Chairman: Kalmer Stordahl, Director
Office of Institutional Research
Northern Michigan University

c. "Large" Public Colleges and Universities

Chairman: Stanley Ikenberry, Dean
College of Human Resource and Education
West Virginia University

d. Inter-Institutional Agencies, State Offices

Chairman: Mrs. Virginia L. Senders
Associate Director
New England Board of Higher Education